THE LANCET.

A Journal of British and Foreign Medicine, Surgery, Obstetrics, Physiology, Chemistry, Pharmacology, Public Health, and News.

TELEGRAPHIC ADDRESS—LANCET, WESTRAND LONDON TELEPHONE NUMBER—GERRARD 5356

No. III. of Vol. II., 1917.
No. 4899. Vol. CXCIII. LONDON, SATURDAY, JULY 21, 1917. Price 8d.

J. & A. CHURCHILL'S NEW BOOKS.

MASSAGE. By J. B. Mennell, M.D. Introduction by Sir Robert Jones. 140 Original Photographs. 8s. 6d. net.

AN EPITOME OF MENTAL DISORDERS. With Chapter on Shell Shock and Battle Strain. By E. F. Ballard, Medical Officer, Mental Block, Military Hospital, Brighton. 6s. net.

PULMONARY TUBERCULOSIS. By W. M. Crofton, M.D., Lecturer in Pathology, Univ. Coll., Dublin. Illustrated. 6s. net.

THE METHOD OF ENZYME ACTION. By James Beatty, M.D. Introduction by Prof. E. H. Starling, F.R.S. 5s. net.

SURGICAL NURSING AND AFTER TREATMENT. By H. C. B. Darling, F.R.C.S., Assist. Surg., Sydney Hosp. 129 Illus. 8s. 6d. net.

THE HEALTHY MARRIAGE. By G. T. Wrench, M.D., B.S. 2nd Ed. 3s. 6d. net.

THE PRIMARY LUNG FOCUS OF TUBERCULOSIS IN CHILDREN. By Dr. Anthon Ghon. Translated by D. Barty King, M.D., M.R.C.P., Assist. Phys., Royal Hosp. for Dis. of Chest. 72 Text-figures, 2 Plates. 10s. 6d. net.

OBESITY AND OBESE HEART. By J. S. Kellett Smith, F.R.C.S. 12 Diagrams. 3s. 6d. net.

NEW EDITIONS. { CRAIG'S PSYCHOLOGICAL MEDICINE. With Sections on Mental Disorders in War. 3rd ed. 15s. net. / HEWLETT'S PATHOLOGY. 4th ed. 12s. 6d. net.

London: J. & A. Churchill, 7, Great Marlborough-street, W. 1.

WORKS BY

SIR PETER FREYER, K.C.B.

ENLARGEMENT OF THE PROSTATE.
With a Description of the Author's Operation of Total Enucleation of the Organ. A Work based on 1450 Cases of the Operation.
Third Edition. With 54 Illustrations. Price 6s. net.

SURGICAL DISEASES OF THE URINARY ORGANS.
With 141 Illustrations. Price 12s. 6d. net.
Baillière, Tindall & Cox, 8, Henrietta-street, Covent Garden, London.

BY P. LOCKHART-MUMMERY, F.R.C.S.

DISEASES OF THE COLON AND THEIR SURGICAL TREATMENT.

Numerous Illustrations and Coloured Plates. 10s. net.

Baillière, Tindall & Cox, 8, Henrietta-street, Covent Garden.

BY C. MANSELL MOULLIN, M.D. Oxon., F.R.C.S., Consulting Surgeon to the London Hospital.
ENLARGEMENT OF THE PROSTATE. Fourth Edition. Price 6s.
London: H. K. Lewis & Co. Ltd., 136, Gower-street.

THE BIOLOGY OF TUMOURS, INCLUDING THE BRADSHAW LECTURE.
New and Revised Edition. Price 2s. 6d. net.
London: H. K. Lewis & Co. Ltd., 136, Gower-street, W.C.

NEW AND STANDARD BOOKS
Published by
H. K. LEWIS & CO. LTD.
See Advertisement Page 12.
London: H. K. Lewis & Co. Ltd., 136 Gower Street, W.C. 1

By H. BELLAMY GARDNER, M.R.C.S., L.R.C.P. Lond.
A MANUAL OF SURGICAL ANÆSTHESIA
Second Edition. Price 7s. 6d. 215 pages, 46 Illus., 8 Plates.
"A concise and well-written handbook."—Edin. Med. Journ.
London: Baillière, Tindall & Cox, 8, Henrietta-street, Covent Garden.

OPERATIVE TREATMENT OF FRACTURES.

By Sir ARBUTHNOT LANE, Bart., M.S.

Second Edition.

With 226 Illustrations. 10s.

The Medical Publishing Company, Ltd., 23, Bartholomew Close, E.C.

Now Ready. Pp. xi.+269. With 3 Charts. 5s. net.
ON ALCOHOLISM: Its Clinical Aspects and Treatment.
By Francis Hare, M.D., Medical Superintendent of the NORWOOD SANATORIUM, Beckenham.
"Marked by candour, common sense, and moderation ..... likely to become the standard text-book."—British Medical Journal.
London: J. & A. Churchill, 7, Great Marlborough-street.

BONESETTING and the TREATMENT of PAINFUL JOINTS.

By FRANK ROMER, M.R.C.S., L.R.C.P. and L. ELIOT CREASY, M.R.C.S., L.R.C.P.

Crown 8vo, 1s. net.

"Messrs. Romer & Creasy strip this branch of practice of the cloud of mystery and miracle which has been thrown around it by interested people and well-meaning, but ignorant supporters. They effectually disprove the foolish charge that the medical profession has wilfully ignored the subject, and they have dealt with it in an unprejudiced spirit. Moreover, they bear witness to the fact that the profession keeps an open mind as to everything connected with the treatment of disease and the relief of pain and physical disability, and is willing to learn from any source anything that may seem likely to be useful for these purposes."—British Medical Journal.
James Nisbet & Co., Limited, 22, Berners street, W.

JUST ISSUED NEW (3rd) EDITION

KEMP ON STOMACH, INTESTINES & PANCREAS

So extensive was the revision for this edition that the work had to be entirely reset. The new matter includes: Radiography of gastric ulcer, gastric cancer, duodenal ulcer, and gall-bladder disease; Lane's kink, Jackson's membrane, duodenal dilatation, and ileocecal valve incompetency; subinfection and protein absorption; chronic intestinal putrefaction; relation of *oral infection* to pernicious anæmia and other diseases; visceral displacements; vaccine therapy in typhoid and antityphoid vaccination; tropical diseases; diverticulitis; gastro-intestinal neuroses; hypochlorhydria.

Octavo of 1096 pages, with 438 Illustrations. By Robert Coleman Kemp, M.D., Professor of Gastro-intestinal Diseases at the Fordham University Medical School.
Cloth, 30s. net.

See also Advertisement page 3. SAUNDERS PUBLISHERS 9, Henrietta Street, London, W.C. 2.

"ASEPSO"

(3% BINIODIDE)

THE GOLD MEDAL ANTISEPTIC SOAP

USED BY H.M. FORCES IN THE FIELD & IN MILITARY HOSPITALS.

Sole Makers:

EDWARD COOK & CO., Ltd.,

Bow, LONDON, E.3.

Iodogénol

IODINE in its **MOST RELIABLE FORM.** | *PÉPIN* | **IODINE** in its **MOST RELIABLE FORM.**

Iodogénol is a preparation containing Iodine in an organic, assimilable form, possessing about 38 times the physiological activity of that of Iodide of Potassium. This preparation has, according to the clinical reports of eminent Medical Men, succeeded where the usual Iodide treatment has failed.

Iodogénol does not produce Iodism or other bad symptoms.

***INDICATIONS.*—SYPHILIS, RHEUMATISM, the various phases of TUBERCULOSIS, GENERAL DEBILITY, &c.**

LITERATURE and CLINICAL REPORTS on REQUEST.

THE ANGLO-FRENCH DRUG CO., LTD., GAMAGE BUILDING, HOLBORN, LONDON, E.C. 1.
Telephone: HOLBORN 1311. (Late M. BRESILLON & Co.) Telegrams: "AMPSALVAS, LONDON."

THE LANCET.

No. 4899. LONDON, SATURDAY, JULY 21, 1917. Vol. CXCIII.

CONTENTS.

The whole of the literary matter in THE LANCET is copyright.

A REPORT on the Treatment of 102 Carriers of Amœbic Dysentery with Emetine Bismuth Iodide. By W. WADDELL, M.D. Glasg., Temp. Captain, R.A.M.C.; C. BANKS, M.B., B.S. Lond., D.P.H., Temp. Captain, R.A.M.C., Bacteriologist; and F. WATSON, M.A. Camb., and W. O. REDMAN KING, B.A. Camb., Protozoologists. Report to the Medical Research Committee from the Military Dysentery Convalescent Hospital, Barton-on-Sea, Lieut.-Col. J. Chaytor White, I.M.S., Commanding. (With an Excerpt from Notes on 2000 Cases of Post-Dysenteric Diarrhœa at the Military Dysentery Convalescent Hospital, Barton-on-Sea, by W. WADDELL.) 73

ORIGINAL ARTICLES.

The Effect of Trinitrotoluene upon the Blood. By P. N. PANTON, M.A., M.B., B.C. Cantab., Clinical Pathologist, the London Hospital 77

War Surgery in Serbia: Penetrating Wounds of the Abdomen. By FERGUS ARMSTRONG, M.D. Edin., F.R.C.S. Edin., late Major (Sanitate), Serbian Army; Chief Surgeon, Serbian Relief Fund's (Lady Paget's) Hospital, Uskub 82

Some Observations on Trench Fever. By E. R. GRIEVESON, M.B., Ch.B. Edin., Captain, Royal Army Medical Corps (T.C.) 84

The Premeningitic Rash of Cerebro-spinal Fever. By C. P. SYMONDS, M.R.C.P. Lond., M.R.C.S., Temp. Captain, Royal Army Medical Corps 86

CLINICAL NOTES:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

Purpuric and Cerebral Symptoms occurring in the Defervescence of English Measles: Two Fatal Cases. By T. GODDARD NICHOLSON, M.B., B.Sc. Lond. 87

Note of a Case of Recovery after Thrombosis of the Superior Vena Cava. By MARY I. HOUNSFIELD, M.R.C.S., L.R.C.P., House Physician, Royal Devon and Exeter Hospital 87

JOURNALS:

The Philippine Journal of Science, Section B, Tropical Medicine, Vol. XI., No. 4. 88

The British Journal of Ophthalmology, Vol. I., Nos. 4, 5, and 6 88

Military Surgeon 88

LEADING ARTICLES.

IN THE INTEREST OF THE WAR CRIPPLE 89

THE MEDICAL RECRUITING BOARDS 90

ANNOTATIONS.

War Emergency Fund of the Royal Medical Benevolent Fund 91

Farm Colonies for the Tuberculous 91

The Rôle of Ophthalmology in the State 92

Ankylostomiasis in Southern India 92

URBAN VITAL STATISTICS:

English and Welsh Towns 96

Scotch Towns 96

Irish Towns 96

SPECIAL ARTICLES.

The Paris Conference on the War Cripple 93

Paris: Advanced Surgical Posts.—Prophylaxis against Measles and Scarlet Fever among the Troops.—Determination by Staining of the Necrosed Parts of a Wound ... 96

The Services 100

CORRESPONDENCE.

The Lumleian Lectures and Medical Research: the Action of Digitalis in Auricular Fibrillation (Dr. Thomas Lewis) 97

The Effects of Swallowing Liquid Chloroform (Mr. Rickard W. Lloyd) 97

The Treatment of War Wounds (Captain Wm. Parry Morgan, R.A.M.C.) 98

Purulent Bronchitis (Captain Adolphe Abrahams, R.A.M.C.) 98

THE WAR.

The Casualty List 99

Casualties among the Sons of Medical Men 99

Foreign Decorations 99

The Training of the Disabled Sailor and Soldier: A County Scheme for Lancashire 99

Hospitals in India 100

MEDICAL NEWS.

Hospital Sunday Fund at Bristol 87

Medico-Psychological Association of Great Britain and Ireland 88

Literary Intelligence 96

Royal College for the Blind, Upper Norwood 98

Treloar Cripples' Hospital, Alton 98

University of Oxford: Pass list 101

University of Cambridge: Pass-list 101

University of Bristol: Pass-list 101

Royal Colleges of Physicians of London and Surgeons of England: Pass-list 101

The National Medical Union.... 101

Royal College of Surgeons of Edinburgh: Pass list 101

King's College Hospital Medical School (University of London) 101

Metropolitan Hospital Sunday Fund 102

Summer Graduation in Belfast 102

The National Welfare and Economy Exhibition 102

Royal College of Surgeons of England: Election of President 102

Society of Medical Officers of Health 102

A Question of Fees 103

Medical Magistrate 103

Royal Albert Hospital, Devonport 103

PARLIAMENTARY INTELLIGENCE.

Notes on Current Topics:—Military Service (Review of Exceptions) Act: Western Command and London.—The Mesopotamia Commission Report.—Public Health (Prevention and Treatment of Disease) (Ireland) Bill 103

House of Commons 103

INDEX.

VOL. I., 1917 ..... III.-XX.

TITLE-PAGE.

(See Notice on p. 95.)

Appointments 104

Vacancies 104

Births, Marriages, and Deaths .. 104

Notes, Short Comments, and Answers to Correspondents ... 105

Medical Diary 105

Meteorological Readings 105

Editorial Notices 105

Manager's Notices 105

Acknowledgments of Communications received 108

FOR INDEX TO ADVERTISEMENTS SEE PAGE 2.

JOHN BALE, SONS & DANIELSSON, LTD.,

PRINTERS, PUBLISHERS, & PROCESS BLOCK MAKERS.

CLINICAL SURGICAL DIAGNOSIS FOR STUDENTS & PRACTITIONERS.

By PROFESSOR F. DE QUERVAIN, Director of the Surgical Clinic, University of Basle. Second English Edition. Translated by J. SNOWMAN, M.D. 862 pp., with 604 Illustrations and 5 Coloured Plates. Royal 8vo. 35s. net; postage 7d.

"We do not know of any better book."—*British Medical Journal.*

THE ANIMAL PARASITES OF MAN. By H. B. FANTHAM, M.A. Cantab., J. W. W. STEPHENS, M.D. Cantab., and F. V. THEOBALD, M.A. Cantab. Royal 8vo. Cloth. Pp. 932. 423 Illustrations. 45s. net; postage 9d. inland.

"The work as a whole can only be described as a marvellous example of the results of industry and erudition."—*The Times Literary Suppt.*

DISTURBANCES OF THE VISUAL FUNCTIONS. Translated by ANGUS MACNAB, M.B., F.R.C.S. Eng. Price 15s. net; postage 6d.

83, 85, 87, 89 & 91, GREAT TITCHFIELD STREET, OXFORD STREET, LONDON, W. 1.

INDEX

MEDICAL AND OTHER BOOKS AND PUBLICATIONS

PAGE

BAILLIERE, TINDALL & COX:—
Freyer, Sir P.—Enlargement of the Prostate ..... Cover 1
Freyer, Sir P.—Surgical Diseases of the Urinary Organs ..... Cover 1
Gardner—Manual of Surgical Anæsthesia ..... Cover 1
Lockhart-Mummery—Diseases of the Colon and their Surgical Treatment ..... Cover 1

BALE, SONS & DANIELSSON:—
De Quervain—Clinical Surgical Diagnosis for Students and Practitioners 1
Disturbances of the Visual Functions 1
Fantham, Stephens, & Theobald—The Animal Parasites of Man .. 1

CHURCHILL, J. & A.:—
Ballard—An Epitome of Mental Disorders ..... Cover 1
Beatty The Method of Enzyme Action ..... Cover 1
Craig's Psychological Medicine Cover 1

PAGE

CHURCHILL—(Continued).
Crofton—Pulmonary Tuberculosis Cover 1
Darling—Surgical Nursing and After-Treatment ..... Cover 1
Ghon—Primary Lung Focus of Tuberculosis in Children Cover 1
Hare—Alcoholism: Its Clinical Aspects and Treatment.. Cover 1
Hewlett's Pathology ..... Cover 1
Mennell—Massage ..... Cover 1
Smith—Obesity and Obese Heart Cover 1
Wrench—The Healthy Marriage Cover 1

FROWDE AND HODDER & STOUGHTON:—
Waring—Surgical Diseases of the Gall-Bladder, &c. 4
Waring Manual of Operative Surgery 4

HILTON & CO.:—
Ghosh's Materia Medica..... 4

KIMPTON:—
Loeb—Operative Surgery of the Nose, Throat, and Ear 5

PAGE

LEWIS & CO:—
Davidson—Localization by X-Rays and Stereoscopy 32
Emery—Clinical Bacteriology and Hæmatology 32
Garton—Electro Therapeutics for Military Hospitals 32
Magill—Notes on Galvanism and Faradism 32
Moullin—Enlargement of Prostate ..... Cover 1
Moullin—The Biology of Tumours ..... Cover 1
Murray—Rough Notes on Remedies 32
New and Standard Books.. Cover 1
Oliver—Studies in Blood Pressure, Physiological and Clinical 32
Osler, Sir William—Aequanimitas 32
Parkes & Kenwood—Hygiene and Public Health 32
Rawling—Landmarks and Surface Markings of the Human Body. 32
Swanzy's Handbook of Diseases of the Eye and their Treatment .. 32

MEDICAL PUBLISHING CO.:—
Lane, Sir A.—Operative Treatment of Fractures ..... Cover 1

PAGE

NISBET & CO.:—
Romer and Creasy—Bone-setting and the Treatment of Painful Joints ..... Cover 1

SAUNDERS COMPANY:—
Cullen—Diseases of the Umbilicus 3
Elsberg—Surgery of the Spinal Cord 3
Kemp—Stomach, Intestines and Pancreas ..... Cover 1
Mayo, &c.—Mayo Clinic Papers of 1916 3
Owen—Treatment of Emergencies 3

WRIGHT & SONS (BRISTOL):—
The Medical Annual, 1917 4
Medical Annual Synoptical Index to Remedies and Diseases 4

MEDICAL LIBRARIES, &c.:—
Baker—Books..... 4
Behnke—Stammering, Lisping, & Cleft Palate Speech 4
Ketley—Stammering 4
Matthews—Wood: Application of Trusses to Hernia 4

OFFICIAL AND GENERAL ANNOUNCEMENTS

ASSISTANCIES, MEDICAL 56

ASYLUMS, HOMES, &c.:—
Ashwood House, Kingswinford .. 49
Barnwood House Hospital..... 53
Bishopstone House, Bedford ... 54
Brunton House, Lancaster..... 53
Camberwell House, Peckham-road 51
Carew Building, Bodmin..... 54
Cheadle Royal 50
Clarence Lodge, Clapham Park .. 50
Coldhurst House School, Alderley Edge 54
Coppice, The, Nottingham..... 50
Dalrymple House, Rickmansworth 52
David Lewis Colony, Alderley Edge..... 54
Duff House, Banff 53
Edwards, Leeds..... 54
General Manager, Craven street.. 54
Ghyllwoods Sanatorium 49
Grove House, Church Stretton .. 50
Grove, The, Catton, Norwich 50
Haslemere Nursing Home 54
Haydock Lodge, Newton-le-Willows 51
Heigham Hall, Norwich 50
Home for Inebriate Women..... 52
Littleton Hall, Brentwood 54
London Fever Hospital 50
Malling Place, Kent 50
Melbourne House, Leicester 52
Mendip Hills Sanatorium 49
Moat House, Tamworth 50
Newmains Retreat, Lanarkshire.. 52
New Saughton Hall, Polton, Midlothian..... 51

ASYLUMS—(Continued).
Nordrach-on-Dee, Banchory 53
Northumberland House, Finsbury Park 51
Northwoods House, Winterbourne 51
No. 321, L.O., Strand 54
Nurse Meacock, Harwell 54
Otto House, West Kensington.... 53
Peckham House 52
Pendyffryn Hall Sanatorium, Nordrach-in-Wales 52
Plympton House, Plympton 50
Portsmouth Corporation Mental Hospital..... 54
Royal Earlswood Institution for Mental Defectives 51
St. Andrew's Hospital, Northampton 50
St. George's Retreat, Burgess Hill 54
Springfield House Private Asylum, Bedford 49
Stretton House, Church Stretton. 50
The Grange, near Rotherham 50
Vale of Towy Sanatorium 54
Warneford Asylum, Oxford 54
Wye House, Buxton 50

FINANCIAL, &c.:—
Equitable Reversionary Interest Society 49

HEALTH RESORTS, BATHS, &c.:—
Caterham Sanitarium 53
Droitwich Brine Baths 53
Smedley's, Matlock..... 53

HOSPITAL, INFIRMARY, SANATORIUM, &c., VACANCIES.. 54-56

HOUSE & ESTATE AGENTS:—
Bedford & Co., Wigmore-street .. 57
Elliott, Son & Boyton, Vere st.... 57
Harrods, Ltd. 57
K. A., Hampstead 57
Ley Clark, Wimpole-street 57

LIFE & FIRE ASSURANCES, &c.:—
Eagle and British Dominions Insurance Company 37
National Provident Institution .. 40
Prudential 48

MEDICAL ACCOUNTANTS, &c.:—
Turner 57

MEDICAL AGENTS:—
Fieldhall, Limited 57
Manchester Clerical, &c., Association 57
Medical Agency..... 57
Needes, I. C. 57
Peacock & Hadley 57
Turner 57

MEDICAL SCHOOLS:—
(LONDON.)
London School of Clinical Med. .. 47
St. Mary's Hos. Medical School .. 47
West London Post-Graduate Coll. 47
(PROVINCIAL, &c.)
University of Birmingham 47

NURSES' ASSOCIATIONS:—
Co-operation of Temperance Male and Female Nurses 49
Female Nurses Association 49
General Nursing Association 49
Hospital for Sick Children 49

NURSES' ASSOC. (Continued).
London Nurses' Association 48
London Temperance Nurses Co-operation 49
Male Nurses Temperance Co-operation 49
Mental Nurses Association 48
Mental Nurses' Co-operation..... 49
Misses Strongwick's Nursing Agency 49
Nurses' Association 48
Nurses' Co-operation 48
Registered Nurses' Society..... 49
St. John's House 49
St. Luke's Hospital 49
Temperance Association of Male Nurses, Ltd..... 48
The Retreat, York 48

OFFICIAL NOTICES:—
City of London Lying-in Hospital 47
Guy's Hospital Speech 47
Institute of Massage and Remedial Gymnastics 47
London School of Tropical Medicine 47
Queen Charlotte's Lying-in Hospital 47
Royal (Sick) Veterinary College, Edinburgh 47
War Emergency Fund of Royal Medical Benevolent Fund .. 6, 7, 8

PARTNERSHIPS & PRACTICES. 58

TUTORS & LECTURERS:—
Medical Correspondence College. 47
Schnelle—Stammering 4
Weymouth 47

TRADE AND MISCELLANEOUS ADVERTISEMENTS

AMBULANCES:—
Daimler Company—Motor Ambulances for hire 11
St. John Ambulance—Invalid Carriages..... 10

BOTTLE MERCHANTS:—
Isaacs 5

CARRIAGES, MOTORS, &c.:—
Armstrong—Chauffeurs', Coachmen's, Footmen's Liveries 10
Beldam Tyre Co., Ltd.—Peldam Tyres 10
Brown Brothers, Ltd.—Duco Spring Gaiters 11
Singer & Co., Ltd.—Singer "10" Doctor's Car 11

CHEMISTS & DRUGGISTS:—
Allen & Hanburys—Hyposol Salvarsan, &c..... 24
Angier Chemical Co.—Angier's Emulsion 14
Angio French Drug Co.—Iodogénol ..... Cover ii
Rhéantine, Blesulfol, Cuprase.. 31
Antiphlogistine..... 21
Battley & Watts—Battley's Liquors 41
Boots Pure Drug Co.—Chloramine-T 18
Chloramine-T Gauze 18
Bristol-Myers Co.—Sal Hepatica. 43
British Oxygen Co.—Oxygen 44
Burroughs Wellcome & Co.—Soloid Brand Tonamine 29
Christy & Co.—Glyco-Thymoline 22
Ergcapiol 43
Clement & Johnson—"Yadil" Antiseptic..... 28
Cook & Co.—Asepso..... Cover ii
Crookes' Laboratories—Collosols. 28
Duncan, Flockhart & Co.—Tuberculins, Vaccines 30

CHEMISTS—(Continued)
Établissements Poulenc Freres—Stovaine 13
Fellows Medical Manfg. Co.—Fellows' Syrup 40
Ferber Ltd.—Blenosan Capsules.. 42
Gale & Co.—Sugonum, Entrapuro, Syrup, Glycerophosphatum 43
Heppells—Trodonal 33
Hewlett & Son—Liq. Santal Flav. c. Buchu et Cubeba 44
Howards' Sodii B carb. 44
Lambert Pharmacal Co.—Listerine 38
Lawson & Co.—Anti Fly Products 48
Maltine Manufacturing Co.—Maltine with Iron 27
Moore & Co., Ltd.—Lymm-Pure-Salt 44
Newbery & Sons—Pulvis Jacobi Ver. 41
New York Pharmaceutical Co.—Hayden's Viburnum Compound 12
Parke, Davis & Co.—Prophylactic Vaccines 23
Raimes & Co.—Slingsby's Nutrient Suppositories 46
Richards & Sons—Al resta Tablets of Ipecac..... 38
Antikamnia Tablets 38
" & Codeine Tablets. 38
Lactopeptine 40
S. P. Charges Co.—Sulphaqua..... 42
Virol Research Laboratories—Clinical Pathology and Research 17
Wilcox, Jozeau & Co.—Arhéol 42
Willows, Francis, Butler & Thompson—Unguentum Eczema 41

DISINFECTANTS:—
Bowley & Son—Vermijell', &c. .. 43
Condy's Fluid..... 10
Jeyes' Sanitary Compounds Co.—Jeyes' Fluid, &c. 15

FOODS—
Allen & Hanburys—Allenburys Diet 25
Benger's Food 19
Blatchley's Dietetic Preparations 46
Brand & Co.—Essence of Chicken 45
British Milk Products Co.—Sanaphos 15
Callard & Co.—Dietetic Foods .. 45
Carnrick & Co.—Liquid Peptonoids 27
Freemans Real Turtle Extract .. 46
Fry's Malted Cocoa ..... Cover iii
Nestlé's Milk 16
Pan Yan Pickle 45
Southall Bros & Barclay—Vitafer 44
Thew, Hooker & Gilbey, Ltd.—Malted Milk 45
Valentine's Meat Juice .. Cover iii
Vi Cocoa 48
Wander, Ltd.—Ovaltine 20

FURNITURE, &c.:—
Carters—Furniture for Invalids and Hospital Supplies 36

HOSPITALS (ISOLATION):—
Humphreys, Limited—Mobile Hospital Buildings, &c.. 35

MED. & SURG. APPLIANCES:—
Bailey & Son—Patent Belts, Trusses, and Elastic Stockings, &c... Cover iv
Davis—Lukens Sterile Catgut with Dulox Needle..... 10
Davis & Geck—Kalmerid Catgut 48
Hogg & Son—Steam Vaporisers 46
Holland & Son—Patent Foot Appliances 10
Medical Supply Association—Greville Therapeutic Incandescent Lamp 35
Millikin & Lawley—Osteology, &c. 10
Norwich Crepe Co.—Norwich Crêpe Bandage 3
Robinson & Sons—Gamgee Tissue 1

MED. APPLIANCES—(Continued).
Timpson & Co.—Ligatures 8
Zeal—Repello Clinical Thermometer 5

MINERAL WATERS, &c.:—
Davis & Davis—Natural Mineral Waters..... Cover iii

OPTICIANS:—
Watson & Sons, Ltd.—Microscopes..... 48

SANITARY APPLIANCES, &c.:—
Brown, Boveri & Co., Ltd.—A-S Refrigerating Machines.... 34
Sleck & Brownlow—Brownlow Filter 39

STATIONERY, &c.:—
Anderson & Son—Doctors' A/c Forms, &c. 57

STOVES, &c.:—
British Commercial Gas Association—Gas-lighting, cooking, &c.. 9

TAILORS, BOOTMAKERS, &c.:—
Burberrys—The Burberry 39
Burberry Service Dress 39
Harry Hall—Service Dress R.A.M.C. and Navy 10

VACCINE LYMPH:—
Chaumier's Calf Lymph 46

WINES, BEER, SPIRITS, &c.:—
Wood, Campbell & Co.—Touraine and Anjou Wines 12

X-RAY, &c., APPARATUS:—
Sterling Corporation—Portable High Frequency Generator 34

MISCELLANEOUS:—
Benzoe—Invalid Staircase Chair .. 57
National Health Society—Educated Women wanted 56

A Report
ON
THE TREATMENT OF 102 CARRIERS OF AMŒBIC DYSENTERY WITH EMETINE BISMUTH IODIDE.

BY W. WADDELL, M.D.GLASG.,
TEMP. CAPTAIN, R.A.M.C.;
C. BANKS, M.B., B.S. LOND., D.P.H.,
TEMP. CAPTAIN, R.A.M.C., BACTERIOLOGIST;
AND
H. WATSON, M.A. CAMB.,
AND
W. O. REDMAN KING, B.A. CAMB.,
PROTOZOOLOGISTS.

Report to the Medical Research Committee from the Military Dysentery Convalescent Hospital, Barton-on-Sea, Lieut.-Col. J. Chaytor White, I.M.S., Commanding.

(With an Excerpt from Notes on 2000 Cases of POST-DYSENTERIC DIARRHŒA at the Military Dysentery Convalescent Hospital, Barton-on-Sea, by W. WADDELL.)

1. *Introduction.*

THE cases dealt with in this paper were discovered to be carriers of *Entamœba histolytica* in the course of the ordinary routine examinations of fæces at this convalescent hospital; none of them were found to be carriers of dysentery bacilli. They were all treated with emetine bismuthous iodide, and it has been thought worth while publishing the results, as this is the first time, so far as we know, that the drug has been tested on such a large scale. The treatment has had the advantage of being carried out under the supervision of one medical officer at a place where the necessary protozoological examinations could be made on the spot.

2. *Previous History of the Cases.*

All the cases came into the hospital as convalescents after dysentery, 52 direct from hospital ships, the remainder from home hospitals.

With 9 exceptions all the cases were invalided from the Eastern Mediterranean area (87 cases) or Mesopotamia (6 cases). The other 9 cases were invalided from France; of these, 5 had exhibited dysenteric symptoms previously in Egypt, and 2 in Gallipoli, while another (10*) contracted dysentery in India in the autumn of 1914, just before being sent to France with a division of Indian troops; of the remaining case from France (1787) we have no further details.

Two other cases (1082, 1684) had previously had dysentery in India in 1908 and 1914 respectively, but as one went subsequently to Gallipoli and the other to Salonika it cannot be said with certainty that they became infected with *Entamœba histolytica* in India. Two cases had formerly had dysenteric symptoms in South Africa, one (787) in 1909, the other (1881) during the Boer War, while a third (1540) had "dysentery or enteric" in the Boer War.

Three cases (899, 1197, 1483) reported having diarrhœa with blood and mucus in France for a few days in 1915 before going to Salonika or Gallipoli; but it is impossible to say whether it was of amœbic origin. Seven cases which had dysentery in Gallipoli afterwards went to Salonika, where they all relapsed.

One case (902) had no history of acute dysentery; he was invalided from Salonika to Malta with nephritis, and, while in hospital there, was found to be passing cysts of *E. histolytica*; there seems no doubt he was a "contact carrier."

There is no direct evidence that in all cases the acute phase of the disease was due to *Entamœba histolytica*; but since the majority of the cases have a history of more or less chronic or intermittent diarrhœa (even in England), with occasional relapses of an acute character, it may be presumed that in them this organism was the cause of the trouble.

A large number had been treated with emetine hypodermically, one or two having received as many as 100 injections. One case (1987) had been operated upon for liver abscess.

3. *Method of Treatment.*

The form of the drug used was a keratin-coated tabloid (prepared by Burroughs, Wellcome and Co.); each tabloid contained 1 grain of emetine bismuth iodide.

As a rule the daily dose, consisting of 3 grains, was given to each man after the mid-day meal. The time of giving the daily dose was decided by the men after trials of various hours; they were less disturbed by taking the dose at mid-day than at any other time, and objected strongly to its being given at night owing to night-calls to the latrine. After having their dose at 1 P.M., all lay down and rested; during the earlier part of the day they were allowed out within the lines, and, being put into blue, they were easily kept under observation.

The 102 cases were treated in various batches between Sept. 15th and Nov. 7th, 1916, and the full course extended over 12 days, until 36 grains of emetine bismuth iodide had been taken. The men treated in the first batch, however, had only eight or nine doses, some of which consisted of two tablets instead of three, so that they had only from 21 to 25 grains each; and two or three others who did not tolerate the drug well, but suffered from great depression, also had less than the full amount.

Each man was provided with a card on which were noted the daily dose and, opposite, the results—number of times sick and number of evacuations—which it produced. Each daily dose was administered by the medical officer's own hand. All the men were placed under the same conditions of living. The diet adopted comprised mainly milk, eggs, fish, puddings, mutton, and cabbage, steamed and sieved.

4. *The Effects of the Treatment on the Men.*

The behaviour of each case under this drug was very much the same.

They practically all were either purged or they vomited, or both. Usually a man who vomited much did not have so much diarrhœa, and a man who had much diarrhœa did not vomit so much; and usually whichever of the symptoms predominated at first, that was the most marked symptom throughout. Very few were violently attacked both ways. Out of the 102 cases, only 2 or 3 were not affected at all, either by vomiting or diarrhœa, and a few had one natural evacuation daily; while 5 vomited only once (see tables for details). The worst cases had on some days 10 or 12 motions in 24 hours, or vomited 5 or 6 or even more times in the day. Of real tolerance of the drug there was none; certainly a number of men as time went on were not so often sick, but that was the best that could be said. The vomiting usually began about an hour after taking the dose, the diarrhœa not often sooner than three hours. Two men had violent colic and required fomentations. It was noted that in the vomit the brick-red colour of the drug was fairly often seen, showing that the keratin coat dissolved before reaching the intestine.

Various stomach and bowel sedatives were tried to control irritation, but none were of any real use except tinct. opii, and that was only used in extreme cases. The tabloids were tried in powder, but the vomiting was sooner produced and increased in intensity; so this was discontinued. A few of the most disturbed cases were kept entirely in bed, which relieved, but did not save them from, attacks of diarrhœa and vomiting.

In three cases of old carriers (1378, 787, and 10) the effect of the treatment on the general health was very pleasing. All three, particularly a staff sergeant of the Indian Army, were weak, thin, pale, and depressed; after the course appetite came back, weight was regained, and all three reported that they felt like new men. In most cases, however, the men were, for the time being, considerably pulled down by the vomiting and diarrhœa produced by the treatment. All were heartily glad when the ordeal ended and they were set free.

The tables show the curative properties which the drug certainly possesses; but until its preparation has been improved, and its intensely irritating properties abated or removed, a just estimation of its value in chronic dysentery cannot be made.

5. *Collection and Examination of Specimens.*

It is obvious that the value of the microscopical examinations depends very largely upon the accuracy with which the identity of any particular specimen can be guaranteed. We think it wise to insist upon this fact, because in practice it is not easy, as might be supposed, to eliminate doubt.

There are in our experience, some men—we believe them to be few—who seem unable to realise the importance of the tests, and will exercise the utmost ingenuity in trying to substitute for specimens of their own fæces those of other men. In some cases this may be done as a joke; in others a man, who suspects himself to be positive, will endeavour to pass off as his own a specimen from a man known, by reason of his approaching discharge, to be free from infection. And even if the collection of specimens is so efficiently supervised that substitution is impossible, one man may persuade another to impersonate him with the same object in view. Elaborate precautions are therefore taken at this hospital to prevent the mixing of specimens,

* The numbers in brackets refer to the case numbers, for which see Tables I. and II.

and any sample about which there can be the slightest doubt is always rejected. We have reason to believe that in many hospitals the necessity for taking these precautions is not fully realised, and the tests made are, to a certain extent, unreliable in consequence.

The specimens were examined with the greatest care, and no test is recorded as negative unless at least two coverslip preparations, each from a different part of the fæces, had been searched without result. As a general rule the suspensions were made in normal saline, but iodine preparations were often used in addition. All problematical specimens, which were especially frequent immediately after treatment, were examined by both of the protozoologists at the hospital.

6. *Results of the Examinations.*

In the accompanying tables will be found the exact amount of the drug received by each man, the period of treatment, the number of doses, the amount of vomiting and diarrhœa produced, and a list of all the tests made, both before and after treatment. A date upon which *Entamœba histolytica* was found is given in italics. An asterisk after the date denotes the presence of cysts, a dagger that of free amœbæ. The presence of only a small number of cysts is marked by one asterisk, of a moderate number by two asterisks, and of a large number by three asterisks; while the number of free amœbæ present is indicated by a similar number of daggers.

The cases fall into two groups: those that may have been cured, and those that definitely relapsed. It is convenient to deal first with the latter group.

(*a*) *The cases that were not cured.*—There can be no doubt that in 19 out of the 102 cases the treatment failed to cure the men of their infections of *Entamœba histolytica*. It will be seen from the table that each of these cases had repeated positive tests after the end of treatment.

It is true that the finding of a small number of specimens of *Entamœba histolytica* on one or two occasions after treatment does not necessarily indicate that the man had not been cured. Thus, in Case 1299, two or three free amœbæ were found on the eighth day after treatment, and although the next two examinations were negative, one or two cysts of *Entamœba histolytica* were found on Nov. 24th, 26 days after treatment; but since then the case has been examined 15 times in the ensuing nine weeks, each time with a negative result; it therefore seems justifiable to include him among the probably cured.

In about half-a-dozen other cases a few degenerate cysts, which might possibly have been those of *Entamœba histolytica*, were found after the end of treatment (nearly always among large numbers of *E. coli* cysts). These cases were kept under observation longer than would otherwise have been the case; but as the small cysts did not recur, the tests have been recorded as negative.

In the 19 cases that were not cured, undoubted examples of *Entamœba histolytica* were found, often in large numbers, on at least two occasions after treatment; and the presence of the organism has been confirmed in each case by other workers since the men left the hospital.

Fifteen of these cases were examined at least once during treatment, and 14 of them were then found to be negative. It is well known, however, that carriers of *Entamœba histolytica* do not always pass cysts every day, at any rate in sufficient numbers to be found in practice (*v.* the examinations before treatment in the tables[1]); the fact that many of these men had one negative examination during treatment does not, therefore, necessarily indicate that they all cleared up temporarily owing to the action of the drug. It was, however, found impracticable to make several examinations of the men while under treatment; and, indeed, for all practical purposes, it is the examinations after treatment that are the most important.

One semi-acute case (787) had a double course of treatment. His general health improved, but at every examination numerous active amœbæ were found in the stools, and this continued after he left Barton. He has since been operated upon for amœbic abscess of the liver.

Another semi-acute case (10) also improved considerably in general health after treatment, but continued to pass at intervals sporadic active specimens of *Entamœba histolytica*. At Barton he had three full courses of the drug, the third course being given towards the end of November. After leaving the depôt he was reported to have passed on Dec. 18th and 19th large numbers of cysts of *Entamœba histolytica* and smaller numbers of them on the 20th and 21st (no cysts were ever found at Barton), which disappeared under a further course of the drug. Unfortunately, the man has gone back to India before his complete cure could be established.

It is difficult to assign any reason for the failure of these 19 cases. It is possible that in some of them the full effect of the drug was not obtained owing to a portion of the drug being lost through vomiting or diarrhœa; on the other hand, some of the worst cases in this respect are among those apparently cured (e.g., 968, 1540, 1628, 1686). Moreover, the first batch of men treated all had considerably less than a full course of the drug, while among them only two cases definitely relapsed.

Another possible reason for some failures may be the form of drug used. In all the cases previously reported upon[2] the drug was given as a powder enclosed in gelatin capsules. Perhaps in some cases the compressed keratin-coated tablets used at Barton may not have got thoroughly broken up, and some of the effect may thus have been lost. Nevertheless, the general production of intestinal disturbances and malaise tends to show that the drug did have some effect. It is possible that had the capsules been pounded up and put into cachets a more satisfactory result would have been obtained. (It is true that powdering the tablets was tried on one occasion at Barton, but from the accounts of some of the men the powder formed a kind of cement on the tongue and was difficult to swallow; a cachet or capsule would overcome this difficulty.) On the other hand, one case (C 26) at Chichester[3] was not cured by a course of 40 grains of the powdered drug, though he may have been cured by a subsequent course of 68 grains.

The duration of infection or the region where it was acquired may possibly have some effect, for it is noteworthy that four out of the five men who are known to have had dysentery previously in South Africa or India (viz., 10, 787, 1684, 1881) were among those who relapsed. There is no evidence, however, that the failure is in any way connected with the intensity or duration of the acute symptoms; indeed, among the relapses is included the one case that had never had any symptoms of acute dysentery (902).

Dobell has shown that emetine hydrochloride fails to cure about two-thirds of the cases treated. It seems to us that while emetine bismuth iodide is a much more efficient drug, nevertheless, at any rate in the form used at Barton, it may fail to extirpate about 20 to 25 per cent. of *Entamœba histolytica* infections. Again, a man who has once relapsed after emetine hydrochloride injections is very seldom cured by a further course of the drug,[4] and similarly the two cases (10 and 787) which had more than one course of emetine bismuth iodide at Barton were still not cured. All the cases that relapsed at Barton have again relapsed after another full course of the drug, with the exception of three men (899, 1393, and 1765). Of these, 1393 has been under observation since treatment for eight weeks, during which he has had nine examinations, all negative, while 1765 has had, similarly, six negative examinations in five weeks, and it seems likely therefore that both these cases have been cured.† The other case has only had four negative examinations (three within eight days of the end of treatment), and his "cure" is therefore much more open to doubt. It seems possible, however, that there may be some cases which are permanently resistant to emetine bismuth iodide.

(*b*) *Cases that were apparently cured.*—While there can be no doubt about the cases that relapsed, it is by no means so certain that the remainder were permanently cured, for it is conceivable that some relapsed after they were last examined. The evidence of cure depends upon the value of the negative examinations, and until we know more about the way the presence of *Entamœba histolytica* in the fæces of relapsing carriers may vary from day to day it is impossible to speak with certainty. We can, however, draw certain conclusions from the behaviour of the cases that did relapse.

The table shows that cysts generally reappeared in the fæces fairly soon after treatment had ceased; thus, out of the 19 cases 10 were discovered still to be infected on the first, 5 on the second, 3 on the third, and 1 on the fourth examination after treatment. The average number of days between the last dose and the first positive test was only 6·5, and it is probable that had daily examinations been made it would have been much smaller. The longest period between the last dose and the last negative test was never more than eight days, except in one case where it was four days longer.

The remaining cases, on the other hand, had an average of 4·3 negative tests after the end of treatment, the average number of days between the last dose and the last test being 17·3. Only one case did not have at least one examination later than the eighth day after the end of treatment, and many had three or four; indeed, if we take the 65 cases that had 12 doses we find that they had altogether 144 negative tests later than the eighth day after the end of treatment, an average of over two per man.

† Since this paper was written both the cases have relapsed. 1393 had 12 negative examinations after treatment at Mont Dore Hospital between the end of November and the middle of February, 1917. He had another negative test at Barton on Feb. 17th. He was subsequently reported to be passing blood in the stools, and a further examination on March 6th revealed the presence of large numbers of cysts of *E. histolytica*. In view of the long period during which this case was negative it is probable that the opinion expressed at the end of para. (*b*), concerning late relapses, will have to be somewhat modified.

It is improbable, therefore, that, had many cases relapsed later, some would not have been detected; and the foregoing facts, together with what we know of other cases followed over longer periods,[5] warrant us in the belief that the majority of these 83 cases may really have been permanently cured.

7. *On the Amount of Emetine Bismuth Iodide Necessary to Effect a Cure.*

Nineteen cases had only eight or nine doses, amounting to 21–25 grains of the drug, and other 7 had also less than 36 grains; yet of these 26 cases only 2 (899 and 1393) definitely relapsed. Most of the others had at least two negative tests

TABLE I.—*Cases that are not known to have relapsed after Treatment.*
(The italics in the table indicate the dates on which *Entamœba histolytica* was found.)

Lab. No. of case.	Total No. of grains of E.B.I. given.	Period of treatment.	No. of doses.	During treatment.				Dates of protozoological examinations.		No. of neg. tests after end of treatment.	No. of days between last dose and last test.
				Total No. of vomits.	Max. No. on one day.	Total No. of motions (approx.).	Max. No. on one day.	Examinations before 3rd day of treatment.	Examinations after 3rd day of treatment.		
318	21	Sept. 15–22.	8	11	5	8	2	Aug. *22***	Sept. 21, 23, 30; Oct. 2, 4, 5, 10, 21.	7	29
814	21	,, ,,	8	11	4	17	5	Aug. *23**	Sept. 21, 23, 30; Oct. 2, 4, 5, 10.	6	18
940	21	,, ,,	8	9	3	28	6	Sept. 6, *7*†	Sept. 21, 30; Oct. 3, 4.	3	12
960	21	,, ,,	8	12	5	19	4	Sept. *6****	Sept. 21, 23, 29, 30; Oct. 2.	4	10
1103	21	,, ,,	8	2	1	14	2	Aug. *22***	Sept. 21, 23, 30; Oct. 2, 4, 10.	5	18
1291	21	,, ,,	8	11	4	26	5	Aug. *26**, *28*†	Sept. 21, 23, 29; Oct. 2, 4.	4	12
1359	21	,, ,,	8	8	4	14	4	Aug. *19**, 24.	Sept. 22, 23, 30; Oct. 2, 4, 10.	5	18
1003	22	Sept. 15–28.	8	19	5	31	10	Sept. *8*†	Sept. 21, 23; Oct. 2, 3, 4.	4	12
738	24	Sept. 15–23.	9	7	4	18	4	Aug. *17**, *27**	Sept. 22, 23, 25, 30; Oct. 5, 6.	4	13
975	24	,, ,,	9	8	3	16	3	Sept. *7****	Sept. 21, *25*; Oct. 2, 4, 5.	4	12
1062	24	,, ,,	9	11	4	20	5	Aug. *30**	Sept. 22, 25, 30; Oct. 2, 4, 10.	5	17
1138	24	,, ,,	9	6	2	13	2	Aug. *21****	Sept. 22, 25, 29; Oct. 3, 4, 11.	5	18
1181	24	,, ,,	9	6	3	33	8	Aug. *21**	Sept. 22, 25, 29; Oct. 2, 4.	4	11
1436	24	,, ,,	9	3	3	36	10	Aug. *22*†	Sept. 22, 25, 29; Oct. 3, 4, 5, 11, 12; Nov. 2.	8	40
1532	24	,, ,,	9	11	3	13	3	Sept. *6****	Sept. 22, 25, 30; Oct. 2, 4, 5.	5	12
1574	24	,, ,,	9	7	4	16	2	Aug. *28**	Sept. 22, 25, 30; Oct. 2, 4, 5, 10.	6	17
879	25	,, ,,	9	1	1	9	1	Sept. *13****	Sept. 22, 25, 29; Oct. 3, 4, 11.	5	18
1540	27	Sept. 29–Oct. 10.	12	36	12	23	5	Aug. *26**; Sept. 8*, 30.	Oct. 7, 13, 17, 21, 28.	4	18
968	30	Oct. 12–24.	11	18	5	51	10	Sept. *27**, *28***; Oct. *11.**	Oct. 25, 30; Nov. 1.	3	•8
935	33	Oct. 12–23.	12	16	4	39	6	Sept. *7*†, *27**; Oct. 13.	Oct. 25, 30; Nov. 2.	3	10
1475	33	Sept. 28–Oct. 9.	12	18	4	44	7	Aug. *24**; Sept. *27***	Oct. 5, 13, 17, 19, 26.	4	17
1788	34	Sept. 29–Oct 10.	12	3	2	23	3	Sept. *16**	Oct. 8, 16, 18, 20, 23, 28; Nov. 2.	6	23
1197	36	Sept. 28–Oct. 9.	12	28	4	34	12	Sept. 4, *8***, *27**	Oct. 6, 16, 17, 21, 30.	4	21
1360	36	Sept. 29–Oct. 10.	12	17	2	38	5	Aug. *21**; Sept. 28.	Oct. 7, 13, 17, 19, 26.	4	16
845	36	Sept. 28–Oct. 9.	12	—	—	16	2	Sept. *11***, *28**	Oct. 6, 13, 17, 19, 26.	4	17
849	36	Sept. 29–Oct. 10.	12	13	3	23	2	Sept. *11***, 30.	Oct. 6, 13, 17, 19, 26.	4	16
855	36	Oct. 12–23.	12	5	3	43	6	Sept. 4, 8, *11**, 16, *22***; Oct. 11	Oct. 25, 30; Nov. 1, 6, 8, 23.	6	31
965	36	,, ,,	12	13	3	27	3	Sept. *11***, *23***; Oct. *11**	Oct. 25, 30; Nov. 1, 6.	4	14
978	36	,, ,,	12	2	1	23	4	Sept. 14, *27***; Oct. *11.**	Oct. 26, 30; Nov. 1, 2.	4	10
1299	36	Sept. 28–Oct. 9.	12	8	2	18	2	Sept. *8**, 27.	Oct. 6, 13, *17*†, 19, 26.	3	17
1328	36	Oct. 12–23.	12	8	2	42	6	Aug. *18***; Sept. *27***; Oct. *11**	Oct. 25, 30; Nov. 2, 6, 24.	5	32
1329	36	Sept. 28–Oct. 9.	12	—	—	17	4	Aug. *18**; Sept. 27.	Oct. 7, 13, 17, 19, 30.	4	21
1330	36	,, ,,	12	—	—	15	4	Aug. 19; Sept. *8***, *27**	Oct. 6, 14, 17, 19, 30.	4	21
1356	36	Oct. 12–23.	12	2	1	34	6	Aug. 19; Sept. *16**	Oct. 25, 30; Nov. 2.	3	10
1372	36	,, ,,	12	2	1	15	2	Aug. 21; Sept. *15***; Oct. 11.	Oct. 25, 30; Nov. 1.	3	9
1378	36	Sept. 30–Oct. 11.	12	6	3	17	3	Aug. *21**; Sept. 27.	Oct. 8, 14, 17, 19, 26.	4	15
1402	36	Oct. 12–23.	12	8	2	31	4	Aug. 22; Sept. *13***, 27; Oct. 11.	Oct. 25, 30; Nov. 1.	3	9
1450	36	Sept. 28–Oct. 9.	12	13	2	16	2	Aug. *23**; Sept. *11**, 27.	Oct. 5, 16, 17, 19, 28.	4	19
1464	36	,, ,,	12	—	—	23	4	Aug. *23*††*; Sept. 27, 30.	Oct. 7, 13, 17, 19, 26.	4	17
1472	36	,, ,,	12	7	2	29	5	Aug. *24***; Sept. *27**	Oct. 7, 13, 17, 19, 26.	4	17
1483	36	,, ,,	12	14	4	19	3	Aug. *24**; Sept. *9***, *22**, *28**	Oct. 5, 14, 17, 19, 28.	4	19
1490	36	,, ,,	12	—	—	18	3	Aug. *24**; Sept. *27**	Oct. 6, 13, 17, 19, 26.	4	17
1514	36	,, ,,	12	3	2	21	3	Aug. *25**; Sept. *7*††, *22**	Oct. 6, 14, 17, 19, 28.	4	19
1517	36	,, ,,	12	7	2	19	4	Aug. *25**; Sept. *7***, *28**	Oct. 6, 14, 17, 19, 21, 25, 28, 31; Nov. 2, 6.	9	28
1522	36	,, ,,	12	1	1	24	4	Aug. *25*†; Sept. 7, 28.	Oct. 6, 14, 18, 20, 28.	4	19
1525	36	,, ,,	12	5	2	22	2	Aug. *25**; Sept. *7**, *28**	Oct. 6, 9, 14, 18, 20, 28.	4	19
1527	36	,, ,,	12	12	3	27	3	Aug. *25***; Sept. *11***, *30***	Oct. 5, 14, 20, 21.	3	12
1539	36	,, ,,	12	1	1	35	4	Aug. *26***; Sept. 8***, 28.	Oct. 5, 14, 18, 20, 28.	4	19
1583	36	,, ,,	12	12	3	27	3	Aug. 28; Sept. *7**, *28****	Oct. 6, 12, 16, 20, 27.	4	18
1585	36	,, ,,	12	1	1	41	6	Aug. *29**; Sept. *28****	Oct. 7, 13, 18, 21.	3	12
1622	36	Oct. 12–23.	12	—	—	12	1	Aug. 30; Sept. *18***; Oct. *10****	Oct. 24, 27, 31; Nov. 2, 9, 13.	6	21
1628	36	,, ,,	12	25	6	28	3	Aug. 30; Sept. 25; Oct. *4**, *5**, 6, 9, 10, *11**	Oct. 24, 31; Nov. 2, 7, 10.	5	18
1650	36	Sept. 29–Oct. 10	12	15	3	25	4	Aug. *31***; Sept. *10**	Oct. 7, 12, 16, 18, 24, 27.	5	17
1653	36	Sept. 28–Oct. 9.	12	2	1	37	5	Aug. *31****; Sept. 30.	Oct. 7, 12, 16, 18, 27.	4	18
1656	36	Oct. 12–23.	12	12	3	21	2	Aug. 31; Sept. *19***, 25; Oct. *13***	Oct. 24, 26, 27; Nov. 2.	4	10
1658	36	Sept. 28–Oct. 9.	12	2	1	32	5	Aug. *31**; Sept *30**	Oct. 5, 12, 16, 18, 24, 28.	5	19
1661	36	,, ,,	12	12	3	32	4	Aug. *31**; Sept. *30**	Oct. 7, 12, 16, 18, 24, 27.	5	18
1686	36	,, ,,	12	29	5	31	5	Sept. *1*†	Oct. 8, 12, 16, 21, 27.	4	18
1712	36	,, ,,	12	12	2	40	6	Sept. *4**, 30.	Oct. 5, 12, 16, 18.	3	9
1718	36	,, ,,	12	20	3	47	7	Sept. *4**, *19**, *30**	Oct. 6, 12, 16, 18, 27.	4	18
1727	36	,, ,,	12	2	2	33	5	Sept. *4***, 19, *26***, *28**	Oct. 5, 12, 16, 18.	3	9
1734	36	Oct. 12–23.	12	10	2	15	2	Sept. 4, 19; Oct. *2***, *10***	Oct. 24, 27, 31; Nov. 2.	4	10
1735	36	Sept. 28–Oct. 9.	12	22	3	35	5	Sept. *4**, *25**, *28**	Oct. 6, 12, 16, 19, 27.	4	18
1754	36	Sept. 29–Oct. 10.	12	3	1	15	2	Sept. 8, *15**, 30.	Oct. 16, 18, 19, 26.	4	16
1755	36	Sept. 28–Oct. 9.	12	12	3	11	1	Sept. *5**, *30****	Oct. 7, 12, 16, 18.	3	9
1783	36	Oct. 12–23.	12	9	3	19	3	Sept. *15***; Oct. *11***	Oct. 25, 30; Nov. 1.	3	9
1787	36	,, ,,	12	20	4	35	5	Sept. *15***; Oct. 11.	Oct. 26; Nov. 2, 4.	3	12
1793	36	,, ,,	12	4	3	22	3	Sept. *18**; Oct. *10**	Oct. 27, 31; Nov. 2.	3	10
1834	36	,, ,,	12	6	3	35	3	Sept. *29**; Oct. *5**, 9, *11***	Nov. 10, 13, 14.	3	22
1867	36	,, ,,	12	19	5	27	6	Oct. *2**, *10****	Oct. 24, 27, 31; Nov. 2.	4	10
1868	36	,, ,,	12	5	2	16	3	Oct. *2**, *10**	Oct. 24, 27, 31; Nov. 2.	4	10
1904	36	,, ,,	12	1	1	21	3	Oct. *4***, 10.	Oct. 24, 27, 31; Nov. 2.	4	10
1911	36	,, ,,	12	3	1	39	4	Oct. *5***, *11**	Oct. 25, 30; Nov. 1.	3	9
1941	36	,, ,,	12	7	2	25	3	Oct. *6***, *11***	Oct. 27, 31; Nov. 2.	3	10
1963	36	Oct. 27–Nov. 7.	12	12	2	26	5	Oct. *10*†, *16*†**	Nov. 13, 15, 20; Dec. 4, 6.	5	29
1974	36	,, ,,	12	5	2	29	4	Oct. *10****	Nov. 13, 15, 20, 29; Dec. 12.	5	35
1982	36	,, ,,	12	9	3	28	3	Oct. *10**, *20***	Nov. 16, 18, 20, 28; Dec. 7.	5	30
1987	36	,, ,,	12	11	2	27	3	Oct. *12**, *16***, 18.	Nov. 13, 15, 20; Dec. 1, 6.	5	29
2031	36	,, ,,	12	6	2	39	5	Oct. *14*†***	Nov. 13, 15, 20, 29.	4	22
2063	36	,, ,,	12	4	1	37	4	Oct. *16**	Nov. 13, 16, 20.	3	13
2084	36	,, ,,	12	18	3	20	3	Oct. *17*†, 29.	Nov. 15, 18, 22, 24, 28; Dec. 5, 7.	7	30
2191	36	,, ,,	12	2	1	33	4	Oct. *20***	Nov. 13, 14, 15, 21, 28; Dec. 7.	6	30
2195	36	,, ,,	12	18	3	17	2	Oct. *20****	Nov. 13, 18, 20, 28; Dec. 7.	5	30

TABLE II.—*Cases that were not cured by the Treatment.*

(The italics in the table indicate the dates on which *Entamœba histolytica* was found.)

Lab. No. of case.	Total No. of grains of E.B.I. given.	Period of treatment.	No. of doses.	During treatment.				Dates of protozoological examinations.		No. of neg. tests between treatment and 1st pos. test.	No. of days between treatment and 1st pos. test.
				Total No. of vomits.	Max. No. on one day.	Total No. of motions (approx.).	Max. No. on one day.	Examinations before 3rd day of treatment.	Examinations after 3rd day of treatment.		
899	21	Sept. 15–22.	8	11	4	19	6	Sept. *12**	Sep.21,23,29;Oct.4,*5**,9*,11*,*21,26;Nov.*10†*	3	13
1393	24	Sept. 15–23.	9	11	5	16	4	Aug. *21****	Sept. 22.25,*30**; Oct.*3**,*4,5,*10**,21,24****	1	7
902	36	Sept. 28–Oct.9.	12	4	1	18	2	Sept. *12*, 27**	Oct. 7, 13, 17, *19*, 21***, 28***	2	10
1324	36	Oct. 12–23.	12	19	4	24	4	Aug. 18; Sept. *8*, 28**; Oct. *11***	Oct. 26, *30**; Nov. *3****	1	7
1428	36	" "	12	23	3	27	4	Aug. 22; Sept. *14****; Oct. 11.	Oct. *25*, 30***; Nov. *1***	0	2
1444	36	Sept. 28–Oct. 9.	12	14	3	35	4	Aug. *23**; Sept. *27***	Oct. 7, *13*, 17*, 19*, 28**	0	4
1553	36	" "	12	11	2	31	4	Aug. 26; Sept. *7**, 28**	Oct. 7, *17*, 18*, 21***, 25**	0	3
1614	36	Oct. 12–23.	12	9	2	11	2	Oct. *10***	Oct. 24; Nov. *2*, 13***, 14**	1	10
1684	36	" "	12	7	2	46	5	Sept. *1††*; Oct. 5; Oct. *11**	Oct. 25, *30****; Nov. 1, *6****	1	7
1688	36	Sept. 28–Oct. 9.	12	8	3	25	3	Sept. *2*, 28***	Oct. 5, *14**, 18, *20***	0	5
1690	36	" "	12	2	2	21	2	Sept. *2**, 28***	Oct. 6, 8, *14**, 18*, 26***	0	5
1763	36	Oct. 12–23.	12	8	2	11	1	Sept. *14††*; Oct. *11**	Oct. 25, *30**; Nov. *1*, 6***	1	7
1765	36	" "	12	15	3	26	3	Sept. *14***, 25**; Oct. 11.	Oct. 25, 30; Nov. *1***, 6*, 8, 9. *13*, 14**	2	9
1847	36	" "	12	21	3	12	2	Sept. *29**; Oct. 11.	Oct. 25, 30; Nov. *1***, 6***	2	9
1881	36	" "	12	8	4	15	2	Oct. *3****, 10.	Oct. *24*, 27*, 31****	0	1
2089	36	Oct. 27–Nov. 7.	12	7	1	37	4	Oct. *17****	Nov. *15***, 15****	0	6
2122	36	" "	12	12	3	23	4	Oct. *18**	Nov. *14*,* 15, *21****	0	7
787	63	Sept. 15–Oct. 9.	22	5	1	60	5	Sept. *13††*	Sept. *21†††*, *23††*, *27††*, *29††**; Oct. *4†††* *8††*, *16††*	0	7
10	72	Sept. 29–Oct. 23.	24	18	2	53	8	Sept. *28††*, *29†††*, *30†††*; Oct. *1†*	Oct. 2, 3, 4, 5, 6, 7, 8, *9††*, *10††*, 12, 13, 14, 16, 18, 19, *20†*, 21, 22, *24†*, 25, 26, 27; Nov. 8, *11†*, 12, *14†*, *15†*, 17.	0	1

subsequent to the eighth day after treatment, and in only 9 cases was the last test previous to the thirteenth day after treatment. On the other hand, the two cases that relapsed are among the three that seem to have cleared up permanently after the second course of treatment (*v. supra* 6 (*a*) last para.), and it seems possible that on the first occasion they did not get sufficient of the drug.

It appears, therefore, that while there are undoubtedly cases which clear up under a smaller amount of the drug, it is preferable to give the full course of 36 grains as a general rule. But if the ill-effects of the treatment on a man's general health are very marked, it would seem quite justifiable to give a somewhat shorter course, inasmuch as it seems likely that the first eight or nine doses of the drug may cure the great majority of those cases which it can cure at all.

8. *Length of Time during which it is Advisable to Keep Patients under Observation after Treatment.*

If all cases could be cured by the drug, as early work seemed to indicate, no examinations after treatment would, of course, be necessary. Our observations, however, seem to show that we may expect 20 to 25 per cent. of failures; and although this is a much better result than that obtained with emetine hydrochloride, yet it indicates that the success of the treatment should be checked by adequate protozoological supervision, if the end aimed at is the elimination of the convalescent carrier, in which case it is important that relapses should be detected.

The results detailed above seem to show that in the majority of cases that are going to relapse cysts will be found in the fæces within a very few days of the end of treatment, and somewhat earlier, apparently, on an average than in cases that relapse after treatment with emetine hydrochloride. One case, however, was not detected until the thirteenth day after completing his course, and if examinations are only made at intervals of a few days, some such cases are bound to escape earlier detection.

Again, it is evident that negative examinations made during or immediately after treatment are of very little value. Leaving out No. 10, which case was examined daily, 9 out of the remaining 18 cases were negative upon their first examination after treatment. In all, they were examined 77 times after treatment, and 30 of these examinations (nearly 40 per cent.) were negative, while 6 cases had two or more negative examinations.

From these considerations, therefore, it would appear advisable that cases which have been treated with emetine bismuth iodide should be kept under observation for not less than a fortnight after the completion of treatment, during which time as many tests as possible (certainly not less than four) should be made.

9. *Effects of Treatment on other Protozoa.*

Fifty-six of the carriers treated were found to be infected with *Entamœba coli*, in 13 of whom it was found once only. In 11 cases it was found only before, and in 11 others only after, treatment. It appears to be at least temporarily affected by the drug, disappearing during treatment, but generally reappearing sooner or later. There is, moreover, a remarkable similarity in the usual time of its reappearance to that of *E. histolytica* in the cases that relapsed. Thus, omitting the 11 cases in which it had not been found before treatment, it reappeared in 19 cases on the first, 12 on the second, and 3 on the third examination after treatment. The average number of days between the last dose and its reappearance was 6·05 (compared with 6·5 for *E. histolytica*), and the longest period between the last dose and the last negative test before its reappearance was eight days, as in the case of *E. histolytica*, except in one case, where it was 11. Thus in general its behaviour is strikingly similar to that of *E. histolytica* in those cases that relapsed.

On the other hand, the flagellate parasites of the small intestine appeared to be unaffected by the drug. *Giardia* (*Lamblia*) was found in 29 of the 102 cases, usually in the encysted form; it was present in the fæces on 10 occasions during treatment.

Chilomastix occurred in 12 cases; the unencysted form was less uncommon than that of *Giardia*, being present on seven occasions, four of them during treatment.

Trichomonas was found in 2 cases only, on the same date during treatment.

Conclusions.

1. Emetine bismuth iodide is much more effective than emetine hydrochloride in the treatment of carriers of *Entamœba histolytica*, but about 20 to 25 per cent. of failures may occur.

2. The intensely irritating properties of the drug in many cases are a drawback in its general application.‡

3. The definite failure to cure 19 out of the 102 cases treated at Barton may perhaps be in part due to the form of the drug employed (a keratin-coated tabloid).

4. It is improbable that there were many relapses later than those discovered; and as several of the cases had only eight or nine doses instead of 12, it seems likely that less than 36 grains may be effective.

5. It is advisable to keep cases under observation for not less than 14 days after treatment, and to examine them not less than four times during that period if relapses are to be detected.

6. The drug is without appreciable effect upon the intestinal flagellates, but has an effect, usually temporary, on *Entamœba coli*.

Acknowledgments.—For information relating to cases which were afterwards treated and studied at Mont Dore

‡ Since the above was written a new preparation of the drug in the form of salol-coated pills has been introduced by Dr. H. H. Dale; we are informed that this preparation of the drug is much less irritating than that used at Barton.

Military Hospital, Bournemouth, we are indebted to Captain S. Shepherd, R.A.M.C., and Mr. D. G. Lillie; for information regarding Case 10 to Dr. G. C. Low; Captain Cambell, R.A.M.C., of Hilsea Military Hospital, kindly enabled us to continue our observations on Case 1974.

References.—1. Cf. also Dobell, "Amœbic Dysentery and the Protozoological Investigation of Cases and Carriers," Medical Research Committee, Special Report Series, No. 4, I., January, 1917. 2. See Dale, "Treatment of Carriers of Amœbic Dysentery," &c., THE LANCET, July 29th, 1916; Low and Dobell, "Three Cases of *Entamœba histolytica* Infection Treated with Emetine Bismuth Iodide," THE LANCET, August 19th, 1916; Dobell, "Incidence and Treatment of *Entamœba histolytica* Infection at Walton," Brit. Med. Jour., Nov. 4th, 1916. 3. Dobell, January, 1917, loc. cit., pp. 80, 81. 4. Ibid., p. 76. 5. See Dobell, November, 1916, loc. cit., remarks on fourth series, and January, 1917, loc. cit., p. 81. 6. Cf. Low and Dobell, loc. cit., Case iii.

POST-DYSENTERIC DIARRHŒA AND ITS TREATMENT.

(An Excerpt from Notes on 2000 Cases at the Military Dysentery Convalescent Hospital at Barton-on-Sea.)

BY W. WADDELL.

This is the commonest sequela of an attack of acute dysentery and it follows both the amœbic and bacillary form of the disease with little distinction between. The post-amœbic diarrhœa is certainly more persistent, and is more prone to relapses. The post-bacillary is more easily controlled and does not relapse anything like as often as the former.

Ordinary astringents may abate the diarrhœa in both cases, and in some cases no doubt stop it, but in most it returns as soon as the astringent medicine is left off, and the case may go on like this for months. The unsatisfactory results from the use of astringents led me to inspect regularly the dejecta, and much information was obtainable as to why astringents fail so frequently.

The motions varied from very pale and almost jaundice-like colour to dark brownish green; they were full of undigested food particles; and were all more or less putrid and highly offensive. The patients passing these motions, which vary in number from two to eight or ten daily, are naturally more or less debilitated and down in weight. The appetite is poor, sclerotics yellow, dull and injected, complexion usually pale, patients languid and dull.

All the symptoms, objective and subjective, indicate a derangement of the liver functions—particularly a dyscrasia of the bile, a reduced output, or both. A chemically deranged bile must needs result in a non-digestion of the bowel contents, and if also the bile flow is diminished, the antiseptic qualities being also inhibited, putrefaction of the bowel contents is directly encouraged. No worse condition could exist where intestinal catarrh is present than that the contents of the already irritated intestines should be in such irritating and septic conditions, as already has been pointed out. Astringents, therefore, often fail entirely, or only partially succeed in bottling up the poisonous bowel contents, and perhaps it is often fortunate they do fail.

Castor oil will give great relief to these cases, but only temporarily, so also will mag. sulph., but neither will bring about a large flow of clean healthy bile, the thing so much required. This, however, can be easily done by full doses of tincture of rhubarb, B.P.

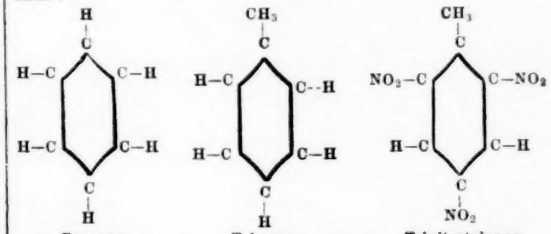
My routine is to give every such case not less than from 4 drachms or even 6 drachms at one dose. Forty-eight hours having been allowed to work it off, the motions are again inspected. If their colour and composition is still unsatisfactory, a second or even a third similar dose is given. When their colour assumes a healthy brown or yellow tone, it indicates that the whole bowel is now freely flushed with clean healthy bile and its putrid contents got rid of. In many cases the diarrhœa now stops of its own accord, but if it still continues a few doses of some binding medicine will be now safe and successful. Usually I give 30 grains bismuth subnitrate with 10 drops of dilute hydrochloric acid and 10 of tinct. opii, two or three doses daily. The diet should be soft and bland so far as possible, and a tonic containing pepsine should follow cessation of the diarrhœa.

Calomel is too severe and causes a lot of colic; so does podophyllin. Euonymin is uncertain. Small doses of tinct. rhei are quite useless; the dose must be large and its action full and speedy. In carrier cases tinct. rhei is useless. It apparently has no effect on *E. histolytica*, whatever it may do to other entamœbæ such as *E. coli* or *Lamblia*, &c. The emetine bismuth iodide is, I believe, the antidote to the *E. histolytica*. This drug I have given in 200 cases with considerable success. Better results will yet be obtained when the drug is improved and rendered less an emetic and purgative, as, being frequently and quickly cast out of the body, there is not time for its full effects to be developed.

THE EFFECT OF TRINITROTOLUENE UPON THE BLOOD.

BY P. N. PANTON, M.A., M.B., B.C. CANTAB.,
CLINICAL PATHOLOGIST, THE LONDON HOSPITAL.

THE present manufacture of previously little used chemical substances upon an enormous scale happens to have thrown some light upon the obscure problem of the causation of blood diseases. We are, if we except chlorosis, as ignorant of the etiology of the so-called primary blood diseases as of their cure, and the proof that the absorption of a definite chemical compound can reproduce exactly a well-recognised blood state is worthy of consideration. Trinitrotoluene, or as it is commonly called T.N.T., is a benzene derivative, thus:—



Benzene. Toluene. Trinitrotoluene.

The effect of benzol upon the blood has been recognised for several years, and the following papers upon this and allied substances may be briefly considered before describing the blood changes among workers in T.N.T.

Previous Observations.

The condition of the blood in men engaged in the manufacture of dinitrobenzol was investigated by Dr. Walter Malden[1] in 1907. The changes in the blood described by Dr. Malden are briefly as follows:—

The red cells are considerably reduced in numbers, they vary in size and shape, and very constantly show marked basophil granulation. Nucleated red cells are occasionally present. The hæmoglobin is proportionately decreased, the colour index being normal. The total white cells are increased, but with a considerable relative decrease in the polymorphonuclear cells. The eosinophil cells sometimes, and the mast cells more often, are relatively and absolutely increased. Dr. Malden's results are based upon the examination of 21 men employed and still at work. No cases of severe illness are apparently referred to in his paper. No animal experiments with D.N.B. are mentioned.

Dr. Selling[2] investigated the action of benzol upon the hæmatopoietic organs of guinea-pigs, and succeeded in producing in these animals a condition of aplastic anæmia. Dr. Selling was led to perform these experiments by the occurrence of three cases of benzol poisoning admitted to the Johns Hopkins Hospital. These cases, two of which terminated fatally, were employed in a tin-box factory for 4–5 months. On admission to the hospital they were suffering from high fever, purpura, and anæmia of the aplastic type. A description of the cases is to be found in the Bulletin of the Johns Hopkins Hospital.[3]

Klemperer and Hirschfeld.[4] These authors repeated Selling's experiments and found in their animals microscopic evidence of more or less severe marrow destruction, also, and in every case, severe and extensive necrosis of the liver and kidneys. They quote Pappenheim as having found similar necrosis in the liver and kidneys of guinea-pigs after 1–2 weeks' administration of 2–3 grammes of benzol. They further refer to experiments in which erythræmia was produced by administration of benzol in small doses.

Kiralyfi[5] describes a fatal case of leukæmia treated with benzol. The white cells became reduced from 73,000 per c.mm. to 460 per c.mm. when the patient died. No post-mortem account is given.

Neumann[6] describes another case of leukæmia treated with benzol in which the leucocytes fell from 56,000 to 5300 in 36 days when the treatment ceased. The leucocytes, however, continued to fall until they reached 200 per c.mm. when the patient died. Post mortem they found marrow changes similar to those produced by Selling in guinea-pigs, but the condition of the liver is not mentioned.

[1] Journal of Hygiene, vol. vii., No. 5, October, 1907.
[2] Ziegler's Beiträge, 1911, Bd. li.
[3] Johns Hopkins Hospital Bulletin, vol. xxi., 1910.
[4] Therapie der Gegenwart, 1913, p. 57.
[5] Wien. Med. Woch., 1913, xxvi., p. 1062.
[6] Therapie der Gegenwart, 1913, p. 56.

Mühlmann[7] describes a fatal case of lymphatic leukæmia treated with benzol. In the liver he found extensive necrosis of the central portions of the acini, as well as diffuse leukæmic infiltration. He refers to the necroses found by Pappenheim in the liver of guinea-pigs after benzol. The necroses in these animals were in the periphery of the lobules and not in the central portions.

Heffter[8] describes the case of a man poisoned by inhalation of benzol fumes. The man died within a few hours of inhaling the fumes. Heffter describes the post-mortem appearances and gives seven other references to cases of acute benzol poisoning. Benzol cannot be discovered in the body after death.

Stadelmann[9] investigated the effects of toluylenediamine on animals. Toluylenediamine has the formula $C_6H_3(NH_2)_2CH_3$. The drug gave different results with different animals. Dogs always got severe jaundice. Cats got hæmoglobinuria and usually slight jaundice. Guinea-pigs got marked anæmia and not true jaundice. No blood counts are given.

Willcox[10] describes cases of aeroplane "dope" poisoning. Willcox, by experiments on white rats, proved the constituent of the dope which causes jaundice to be tetrachlorethane. In this description of the human jaundiced cases he makes no mention of the blood condition. The association of tetrachlorethane with dope poisoning had been previously proved and published by Heffter and Joachimoglu.[11]

Investigation of those Actually at Work.

In considering the effect of T.N.T. upon the blood it was thought worth while to examine first by the ordinary methods of blood-counting and microscopy the blood of a series of people actually at work upon the substance. Fifty cases were thus examined and the results tabulated. The tables are not given here, but are included in a report to the T.N.T. Advisory Committee. The 50 cases were all women and all at work at the time of the examination. The cases were taken more or less at haphazard, but a few women who were noticed in the works to look pallid were purposely examined, and those who had been the longest employed were especially asked for. A large percentage had slight blueness of the lips and a few were markedly cyanosed. The girls, as a whole, looked fit and well. Some were of pallid complexion, but this is no guide to the blood condition. The time employed in the factory varied from one year and three months to a few days. It may be said at once that there is no evidence that the daily absorption of T.N.T. by these women had any deleterious effect upon the blood.

The red cells, hæmoglobin, and colour index are not adversely affected. I judged the average number of red cells in women of this class to be between 5 and 6 million to the c.mm., and nearer the latter than the former number; and the average hæmoglobin percentage to be about 90 per cent. or possibly a little under.

A subsequent routine examination of a number of girls employed in the manipulation of another substance leads me to think that the normal standard is probably lower than that given, and suggests that the average worker in T.N.T. may receive actual benefit to the number of red cells and the percentage of hæmoglobin.

I thought at first that the lowest readings occurred among the latest comers to the works, but this is not borne out by the figures.

The average number of red cells among those employed more than three months (24 cases) is 5,200,000 per c.mm., the average hæmoglobin percentage is 88·7. The average red cells among those employed less than three months (26 cases) is 5,700,000 and the average hæmoglobin 90 per cent.

If those employed one month or less are taken and the case of an abnormal plethoric girl employed only a few days is omitted, 9 cases are left with average red cells 5,500,000 and average hæmoglobin 86·1 per cent.

These numbers are sufficiently close to justify the statement that no appreciable change in the number of red cells nor in the percentage of hæmoglobin could be traced to a duration of employment greater than one month.

The morphological characters of the red cells throughout were normal. Not a single nucleated red cell nor a single cell showing granular degeneration was observed in 50 stained preparations. A very slight degree of poikilocytosis was seen in a few films. Three of the more anæmic cases were re-examined two weeks later and were found to be slightly less anæmic. Slight degrees of anæmia are necessarily found in examinations of girls of this age and condition. So far as the red cells and hæmoglobin are concerned no such changes are found as were noted by Malden among the D.N.B. workers. Yet the women at this factory were daily absorbing doses of T.N.T., since, at the time of this examination, Professor Benjamin Moore had proved the elimination of a T.N.T. compound in the urine of all workers examined. There is no alternation of labour in this factory.

The white cells of the blood in a very large percentage of cases were well above the normal number, and that this increase resulted from the employment is suggested by the high figures found among those longest employed. In 40 cases at work more than one month the average number of leucocytes was 10,000 per c.mm. In 9 cases employed one month or less the average number was 7500. I should judge the normal number to be from 4000 to 6000. The relative proportions of the white cells were not greatly altered, but many cases with high counts showed a distinct relative increase in the polynuclear neutrophils. The eosinophil cells were in a large number of cases above the normal. Very few abnormal white cells were seen in any preparation. In view of the blood changes found in the cases of severe anæmia to be described, it seems probable that this leucocytosis, usually of the inflammatory type, is due to a stimulation of the hæmatopoietic system by the poison.

In addition, 100 women, chosen at random from those at work in the same factory, were investigated as to cyanosis and cholæmia.

A.—*The incidence of cyanosis.*—It is unfortunate that on the days on which this examination was made the weather was very cold and bitter, so that it was often impossible to decide between the blue lips of toxic cyanosis and those due to atmospheric conditions.

All the cases examined were seen immediately after the conclusion of their shift, and of the 100 cases 78 were noticed to be cyanosed; of the 78, 18 were markedly cyanosed.

A percentage of 78 probably exaggerates the incidence of cyanosis owing to the atmospheric conditions before mentioned. The most marked case of all, on further examination, turned out to be in all probability the subject of congenital morbus cordis. Another case had suffered from rheumatic fever. But if every allowance is made it is evident that some degree of cyanosis is very common among employees.

The cause of the cyanosis has been taken to be the presence of methæmoglobin in the blood. It is probably a mixture of methæmoglobin and NO hæmoglobin. The amount of the substance in the blood is insufficient to give a spectrum with the ordinary small spectroscope, and proof of its presence rests upon the use of a test devised by Haldane. This test is extremely simple to perform, but in my experience in these cases almost impossible to interpret.

In this investigation an accurate dilution of the blood was made in each instance—namely, 10 c.mm. of blood in 1 c.c. of water. Normal bloods were taken as controls. In each sample the oxyhæmoglobin was converted into CO hæmoglobin by the passage of coal gas. Blood containing a trace of methæmoglobin appears of a muddy colour when contrasted in daylight with the bright pink of pure CO hæmoglobin. The amount of the abnormal substance in the blood of these women is so small that in scarcely a single instance was a really obvious result obtained, nor did the results of the test correspond with the clinical degree of cyanosis. Thirty-six were noted as giving a positive result, but in only two of these was the reading at all definite. An obvious difficulty in reading these minute differences of colour is caused by the different values of hæmoglobin in the various samples. I have since been informed that clearer results are obtained by the use of pure CO in preference to coal gas.

Both toluol and amatol powders give off in small quantities at room temperature gases smelling strongly of nitrous oxide. It is true that T.N.T. sublimes as such, but the sublimate is white, the crude powder is yellow, and presumably over nitrated, since if T.N.T. is washed in water the powder becomes white and the water yellow. No such smell is given off by the sample of D.N.B. in my possession. Further, ammonium nitrate, a constituent of amatol, if warmed gives off laughing gas, but if heated NO in addition.

In the following experiment two guinea-pigs were killed, one by exposure to amyl nitrite vapour, the other by NO. The blood of both animals gave Haldane's test, and the animal killed by NO vapour gave a stronger test in dilute solution of its blood than the other animal. The possibility of NO hæmoglobin or the usual mixture of NO and methæmoglobin being produced in the blood of workers by the

[7] Deutsch. Med. Woch., xxxix., p. 2083. [8] Ibid., p. 182, 1915.
[9] Der Icterus, Stuttgart, 1891. [10] THE LANCET, 1915, vol. i., p. 544.
[11] Vierteljahrschr. f. gerichtl. Med. u. öffentl. Sanitätswesen, 1914, xlviii. supp., p. 32.

inhalation of nitrous fumes has to be considered, but the percentage of such fumes in the atmosphere at any time must be extremely small.

B.—*The incidence of cholæmia.*—It was thought that the percentage of workers with bile pigment in the serum might be a guide to the incidence of liver changes without actual jaundice.

A sample of blood was taken from each of the hundred workers into a serum tube and allowed to stand until the next day, when the colour of the serum was examined by daylight. In 20 of the cases the serum was bile-tinged. This would appear to show that in a high proportion of those at work some action of the poison upon the liver was taking place. Allowance must, however, be made for the fact that among ordinary members of the community a small percentage of bile-stained sera are found, particularly among those subject to constipation. All of these employees were women, but even so a percentage of 20 bile-stained sera would seem unduly high. No case was noticed to be jaundiced, and only three sera were at all deeply bile-tinged. Even a percentage of three cases of toxic cholæmia would lend support to the supposition that T.N.T. workers may be receiving damage to the liver without attacks of sickness or toxic jaundice.

The 20 per cent. of cases with bile-tinged sera is, however, sufficient practical objection to placing workers on the sick list on this account alone.

Normal persons may have bile-tinged sera, but in my experience the appearance of bile in normal sera is periodic. The serum of a worker which remained obviously bile-tinged over a period of 10 days and in spite of purgation would be very suggestive of poisoning.

The conclusions, then, to be drawn from an investigation of those actually at work and in contact with T.N.T. are as follows.

1. That no adverse effect is produced on the red cells and hæmoglobin; but, on the contrary, it is suggested that some stimulation of the erythroblastic tissues is induced.

2. That there is an appreciable increase in the leucocytes, an increase which, in view of the changes which may occur in T.N.T. poisoning, may be ascribed to a noticeable stimulation of the leucoblastic tissues by the drug.

3. That cyanosis is common among T.N.T. workers, and that the cause of the cyanosis is possibly the production of NO hæmoglobin, possibly methæmoglobin, probably a mixture of both compounds.

4. That bile pigment is present in the blood in such a proportion of cases as to make it possible that liver damage is taking place in the absence of symptoms, but owing to the occurrence of bile-tinged sera in otherwise normal individuals such damage cannot be taken as proved, and the test cannot be accepted as ground for removing a workman from his employment.

Investigation of Cases of Sickness.

In the next place, cases of sickness arising among T.N.T. workers were investigated. These cases include a few examples of minor illnesses, a number of severe anæmia cases without jaundice, and a considerable number of toxic jaundice cases. These anæmic and jaundiced cases were examined where possible over intervals of time. Cases of anæmia were seen without jaundice, and of jaundice without anæmia. Some jaundiced cases subsequently developed anæmia, and in view of the extreme gravity of the form of anæmia set up the relationship of the anæmia to the jaundice was particularly investigated.

In addition to the ordinary blood examinations, certain other tests were performed in some instances. Bile was looked for in the serum; the fragility of the red cells was estimated and, following certain observations communicated to me by Dr. F. H. Jacob, of Nottingham, the Wassermann test was performed in a few cases.

In all 34 cases of sickness arising among T.N.T. workers were investigated. Of these 34 cases, 4 were examples of somewhat severe gastric disturbance without jaundice or anæmia, 6 were suffering from the peculiar form of anæmia to be described, and 28 had toxic jaundice. Four of the anæmic cases were jaundiced also. The main points in the routine blood examinations of all these cases are shown in the table.

Gastritis cases.—Of these four cases, No. 18, a young girl of 18 years, showed a notable degree of anæmia, but the blood changes were not those of the aplastic type. After five days' absence from work she was still cyanosed, and her blood gave a strongly positive Haldane test. The fragility of her red cells was normal. Case 19 had had several attacks of gastritis, and had never been jaundiced. The blood condition was normal. Cases 23 and 24 were both men who had been sent to hospital as instances of early toxic jaundice. Both had gastric symptoms and deposits of conjunctival fat; neither was jaundiced. The blood condition was normal in both cases, and the serum quite free from bile.

Toxic jaundice and anæmia.—While considering these two conditions under the same heading, I believe them to be distinct and separate pathological states not necessarily dependent the one upon the other.

It has been suggested that the T.N.T. poison produces first a methæmoglobinæmia, then hæmolysis, and finally anæmia. The suggestion does not appeal to me in theory, and such evidence as I have been able to collect is opposed to it. It appears that while the jaundice follows destruction of the liver tissue, the anæmia follows destruction not of the blood but of the red marrow. What may be the exact substances which produce these changes, and whether these substances are in the two cases identical are matters of speculation; what is certain is that jaundice occurs without blood changes, and, more important, blood changes occur without either jaundice or liver destruction.

The percentage of jaundiced cases developing anæmia.—In an interesting article in THE LANCET of Jan. 27th, 1917, Captain M. J. Stewart gives a résumé of a paper read by him at the Royal Society of Medicine. Of 14 cases of toxic jaundice he considered 13 to show definite blood changes, but of these 13 only 3 showed any marked anæmia, which he describes as of the "pernicious" anæmia type.

The blood changes referred to by Captain Stewart include a leucocytosis, a leucopenia with a relative lymphocytosis and an eosinophilia. The leucocytosis and the eosinophilia I have shown to be present very constantly in T.N.T. workers, and it is probably due to stimulation of the red marrow. A leucopenia with a relative lymphocytosis is an accompaniment of aplastic anæmia, but has little significance in the absence of red cell changes. The number of leucocytes and the percentage of lymphocytes are subject to wide variations in health. The total number is very commonly lower, and the percentage of lymphocytes usually higher in normal persons than is indicated in the majority of text-books. This is so far unfortunate in that a leucopenia with a relative lymphocytosis has been described by many observers as typical of this or that pathological state. Of Captain Stewart's 14 cases, only three show severe blood changes, and these, with the possible exception of one case, I should prefer to describe as of the "aplastic" rather than of the "pernicious" anæmia type.

Of the 28 examples of toxic jaundice considered here, only four have shown blood changes of importance, and the changes in these four cases have been those of aplastic anæmia. It is possible that some of these cases may develop anæmia, but it is unlikely. So far as possible all cases seen in the acute jaundiced condition have been re-examined about three months later. Other cases were seen for the first time in the convalescent stage 6–9 months after jaundice first appeared. Aplastic anæmia is not a transitory condition, it may be fatal in about seven weeks (see Case 2), or it may drag on for months (see Case 1 and Case 5). I have not yet seen a case of complete recovery.

If Captain Stewart's cases are added to those in the table we have 42 cases of toxic jaundice, of which 7 developed severe anæmia, or a percentage of 16·6. Such a percentage is sufficient to indicate that T.N.T. workers who develop toxic jaundice run a definite risk of acquiring aplastic anæmia also.

The nature of the jaundice.—The incidence, the mortality, and the prognosis of toxic jaundice is beyond the scope of this examination. Certain points, however, may be noted because they tend to vitiate the official statistics.

A number of cases notified as toxic jaundice are not jaundiced at all. A few such cases have been met with in this investigation. In all cases of doubt the serum should be examined. A patient with a clear serum has not got toxic jaundice. A patient with a bile-tinged serum may have.

All cases of catarrhal jaundice occurring in T.N.T. workers are unavoidably notified as instances of toxic jaundice. Some mild examples of jaundice in the table are in all probability cases of simple catarrhal jaundice. Other rarer forms of jaundice will also help to swell the figures. Case 3 is probably an example of familial hæmolytic icterus with possibly toxic jaundice in addition.

The nature of the jaundice is properly described as a toxic jaundice, and the toxic substance acts upon the liver cells. It is not a hæmolytic jaundice, since, in the majority of cases, there is no evidence of blood destruction. In those cases met with here in which anæmia supervenes the blood changes commenced as the icterus passed off (see Cases 4, 5, and 6).

In the rare condition known as hæmolytic icterus the *fragility* of the red cells is greatly increased, in other forms of jaundice it is slightly diminished. In one convalescent case examined here the fragility was normal; in three jaundiced cases the fragility was diminished.

The relationship of the Wassermann reaction to toxic jaundice is a point of some interest. If all, or a high percentage of, toxic-jaundiced patients gave a positive Wassermann reaction it might be argued that the reaction resulted from the effect of the poison and not from syphilis. Dr. Jacob informed me that he found a positive Wassermann reaction in three consecutive cases of severe jaundice. I examined one severe case and seven convalescent cases, the majority of whom still had bile-tinged sera and had been very severely jaundiced. The reaction was negative in all cases. It is suggested that a positive Wassermann reaction in toxic jaundice is proof of syphilitic infection, and though the jaundice in such cases may be toxic and not syphilitic it is probable that a syphilitic person is more susceptible to the action of the poison than a normal individual, a detail with some bearing upon the question of compensation.

The latency of the jaundice is well shown in Case 16, a woman who left work owing to an injury and five weeks later developed jaundice. The long period which may elapse between exposure to the poison and development of symptoms is well known and very remarkable. It is referred to again in considering the anæmic cases.

The duration and after-effects of toxic jaundice.—An examination of a series of cases of toxic jaundice leaves one with the impression that the illness is long and serious and that a complete recovery is possibly more rare than is supposed.

The actual mortality I am not in a position to state; it is probably considerably higher than appears in the official notifications owing to the number of cases returned, often unavoidably, which are not instances of toxic jaundice, and a further percentage returned as recovered, who may still succumb to the after-effects of the poison.

Some of the cases in the table were seen as long as nine months after the appearance of the jaundice and still showed bile in the serum. Case 5 became jaundiced in April, 1916, recovered, and returned to work, but not in T.N.T. He died of aplastic anæmia on Feb. 16th, 1917. His liver was scarred and puckered as the result of his old jaundice.

I have scarcely seen a single convalescent case who admits feeling as well as formerly. The majority display a noticeable lassitude and loss of energy.

The persistence of bile in the serum is remarkable. Of these 28 cases the serum was free at the time of the last examination in seven only. Of these seven, four were only slight cases, and possibly instances of catarrhal jaundice. Of the remaining three cases two were severe and the serum was clear eight months and nine months respectively after the onset.

It is probable that all severe cases are left with damaged livers, but it cannot yet be stated whether the change is progressive or not.

The nature of the anæmia.—The six cases of anæmia met with in T.N.T. workers appear at the beginning of the table. The full development of the condition is best shown in Case 4.

The type of anæmia produced is that known as aplastic anæmia. This condition is met with in ordinary civil practice, but it is extremely rare. It is far less frequently seen than the unusual blood state—pernicious anæmia. Aplastic anæmia has been occasionally noted to develop as the result of a definite poison such as benzol, but cases are from time to time met with in whom no clue to the causation of the disease can be detected. Two such cases were recently in-patients of the London Hospital, but instances of pernicious anæmia at this hospital must be more than ten times as numerous. I have not met with an example of pernicious anæmia among T.N.T. workers.

Aplastic anæmia can be differentiated from pernicious anæmia during life by an examination of the blood, and after death by the changes found in the organs.

Pernicious anæmia appears to be a disease characterised by abnormal blood destruction imperfectly compensated for by abnormal marrow activity. Aplastic anæmia appears to be produced by red marrow destruction.

The changes found in the blood in aplastic anæmia are as follows:—The red cells become steadily reduced in numbers, but retain the normal or more than the normal percentage of hæmoglobin. Consequently, in spite of the fall in the percentage of hæmoglobin which accompanies the diminution of red cells the colour index is high, as in pernicious anæmia.

The diminution in the number of red cells takes place without change in their morphology. Poikilocytosis, polychromatophilia, and granular degeneration with the appearance of normoblasts and megaloblasts, all characteristic of pernicious anæmia, are almost entirely absent in this condition. A few such abnormal cells may appear at the time of death, but during the course of the disease they are absent. Some alteration in the relative sizes of the red corpuscles is usual, but in every other respect the appearance of these cells in a stained film is normal.

The total number of leucocytes shows an equally characteristic diminution, and this diminution takes place almost entirely at the expense of the granular or essentially marrow cells. The polynuclear neutrophil leucocytes in one of these cases were reduced to 4 per cent. of a total leucocyte count of 1000 per c.mm. These scanty survivors of the marrow cells were noticeably degenerate in appearance, and their granulation was more sparse than appears in normal cells. The lymphocytes, on the other hand, were perfectly normal in their appearance and were not greatly reduced in total numbers. Since the characteristic feature, post mortem, is the disappearance of the red marrow, the blood picture during life yields information as to the sites of origin of the granular and non-granular cells respectively. This atrophy of the leucoblastic marrow may be considered in connexion with the leucocytosis found to be prevalent among T.N.T. workers. It is suggestive that the poison stimulates marrow activity, and that in exceptional circumstances the stimulation is succeeded by destruction.

The latency of the anæmia.—If the period which may elapse between absorption of the poison and development of icterus is remarkable, the latency of the anæmia is more remarkable still; it is also in jaundiced cases developing anæmia more possible to observe. In Case 4 the anæmic state did not become noticeable until about six weeks after the appearance of jaundice. In Case 5 the anæmia developed nine months after employment in T.N.T., but in this case it is probable that some changes were present at an earlier date, and in the interval the man had returned to work in a T.N.T. factory, though he was not actually handling T.N.T. In Case 6 the anæmia developed four months after leaving work, and while still in hospital, as the result of toxic jaundice.

The explanation of this latency cannot yet be given. It has been suggested that the poison is ingested, stored in the tissues, and subsequently liberated. Yet it has not been possible to detect T.N.T. or T.N.T. derivatives in any of the organs of fatal cases, and in view of the extreme length of the latent period such an explanation seems to me improbable.

The course of the anæmia.—Of the six cases described here two are dead. One died about seven weeks after the anæmia was recognised, the other about five weeks after. A mortality of one in three does not, however, represent the gravity of the condition. I have never known a case of aplastic anæmia in civil practice to recover, and none of these cases are yet out of danger. The six cases might be increased to seven by the addition of a similar example to Case 2, arising in the same factory, in whom the cause of death was proved post mortem. This would make seven cases with three deaths. Case 3 has a peculiar condition, and is possibly not aplastic anæmia. If this is omitted we have six cases with three deaths. Case 4[12] is extremely unlikely to recover. Case 6 has not yet completely developed. Case 1 is the only patient so far to show any sign of recovery, and his blood condition is definitely improving. Improvement, however, may occur even in aplastic anæmia, only to be followed by a fatal relapse.

The peculiar anæmia which may affect T.N.T. workers is therefore an extremely dangerous and fatal disease. It is not yet possible to say whether it is ever recovered from. Fortunately, it is a very rare condition, and the risk to any individual worker in T.N.T. of dying from this disease is almost negligible.

Drugs appear to have little or no effect upon the course of the disease. The most rational treatment would appear to be a course of transfusions of blood. To be of use numerous transfusions, each of 500–600 c.c. over a period of several weeks, would be indicated in order to give the red marrow a chance of recovery. It was unfortunately not possible to attempt this method of treatment in any of the patients seen by me. Residence of the patient in a large general hospital is, at the present time, essential if treatment by transfusion is to succeed.

Purpura has been mentioned as having been noted in cases of benzol poisoning. Two cases of purpura—both fatal—have been notified by Dr. Jacob among T.N.T. workers at Nottingham. The following patient, not included in the 32 cases of the table, was recently admitted to the London Hospital: J. E., a girl of 21, had been working on the manufacture of T.N.T. for seven months and until a fortnight previously, when the works were closed down. She was stated to have been on several occasions overcome by the fumes developed in the nitrating process. A girl who worked with her was said to have recently developed toxic jaundice. Ten days before admission she commenced to bleed from the vagina, and subsequently from the rectum and mouth. On admission she was extremely ill, was bleeding profusely, and had a purpuric rash over the limbs and trunk.

A blood examination showed—

Red cells 1,200,000 per c.mm.	Colour index ... 0·3
Hæmoglobin ... 8 per cent.	White cells ... 480 per c.mm.

[12] Case 4 has since died—April, 1917.

Of the white cells, 75 per cent. were lymphocytes and only 10 per cent. polynuclears. The stained blood picture was that of aplastic anæmia.

The coagulation time estimated by Wright's method was four minutes.

The patient died two days later, and post mortem no liver necrosis was present, the vertebral marrow was grey, and there was less than the normal amount of red marrow in humerus and femur.

In view of the blood condition, the post-mortem appearances, and the striking tendency of aplastic anæmia subjects to profuse bleeding, I think it probable that the purpura was an incident in the course of a case of aplastic anæmia, and that the profuse hæmorrhage hastened death and altered the colour-index to the chlorotic type.

Such a case, if nothing had been known of the patient's connexion with T.N.T., would have been classed as "hæmorrhagic purpura," of which, as of all purpuras, we

TABULAR STATEMENT OF RESULTS OF INVESTIGATION IN 34 CASES OF SICKNESS AMONG T.N.T. WORKERS.

No.	Name.	Male or female.	Date of examination.	Date of onset of jaundice.	Jaundiced now.	Bile pigment in serum.	Percentage of hæmoglobin.	Red cells.	White cells.	Colour Index.	Polymorpho-nuclears.	Small lympho-cytes.	Large lympho-cytes.	Large hyalines.	Eosinophils.	Mast cells.	Other white cells.	Remarks.
1	J. B.	M	Oct. 1, 1916.	Never.	No.	—	25	1,410,000	5,200	0·9	22·0	74·0	...	4·0	...	...	...	(Dr. Jacob.)
	,,		Dec. 7, ,,	,,	,,	—	40	2,225,000	16,000	0·9	51·5	11·5	14·5	22·0	...	...	My* 0·5	Anisocytosis.
	,,		Mar. 1, 1917.	,,	,,	—	65	2,200,000	3,000	1·4	68·0	17·5	7·5	7·0	...	...	...	,,
2	P. C.	M	Nov. 27, 1916.	,,	,,	—	35	1,637,000	1,400	1·1	20·0	50·5	28·5	3·0	...	...	...	Slight anisocytosis. Died Jan., 1917.
3	H. H.	F	Dec. 7, ,,	Nov. 12, 1916.	++	+++	75	4,180,000	13,400	0·9	49·0	28·5	15·0	5·5	2·0	...	...	Poikilocytosis ++
	,,		Mar. 1, 1917.		+	++	70	3,030,000	9,200	1·1	57·5	33·5	5·5	3·5	...	...	...	
4	S. S.	F	Jan. 5, 1917.	Dec. 27, ,,	+++	+++	95	5,900,000	11,800	0·8	70·0	18·0	9·0	1·5	0·5	1·0	...	Red cells normal.
	,,		Jan. 29, ,,		++	+++	90+	5,010,000	7,600	0·9	42·5	32·5	18·5	2·5	4·0	...	...	,, ,,
	,,		Feb. 5, ,,		++	+++	82	4,200,000	5,000	0·9	45·5	36·0	10·5	6·0	2·0	...	...	,, ,,
	,,		Feb. 19, ,,		+	++	88	3,500,000	4,600	1·2	26·0	48·0	22·0	...	3·0	1·0	...	,, ,,
	,,		Mar. 5, ,,		+	++	55	2,540,000	3,000	1·1	15·5	54·5	28·5	1·0	0·5	...	...	Anisocytosis.
	,,		Mar. 19, ,,		+ faint	++	30+	1,470,000	1,000	1·1	4·0	70·0	21·0	5·0	...	...	...	,,
5	E. K.	M	Jan. 13, ,,	April 5, ,, Recovered and returned to work in August.	No. But facies of pernicious anæmia.	+ faint.	30+	1,360,000	3,200	1·1	51·5	34·0	12·0	2·5	...	...	...	,,
6	R. R.	M	Dec. 7, 1916.	Nov. 5, 1916,	+	++	95	5,400,000	3,400	0·8	29·0	43·5	14·5	10·5	2·0	0·5	...	Red cells normal.
	,,		Mar. 1, 1917.		?	+ faint.	65	2,840,000	3,000	1·1	34·0	42·0	14·0	4·0	6·0	...	...	Anisocytosis.
7	H. G.	M	Dec. 1, 1916.	Oct. 20, ,, (slight).	No.	—	95	5,600,000	9,200	0·8	61·0	7·5	25·0	5·0	1·5	...	...	Red cells normal.
8	G. R.	F	Dec. 1, ,,	Nov. 13, 1916.	++	+++	100	5,640,000	7,400	0·8	57·5	17·5	13·5	8·0	2·5	1·0	...	,, ,,
9	E. G.	F	Dec. 1, ,,	Oct. 4, ,, (slight).	No.	—	90	6,800,000	10,200	0·7	45·0	15·0	26·0	8·5	5·5	...	...	,, ,,
10	E. B.	F	Dec. 6, ,,	Nov., 1916.	+	++	90	5,400,000	6,800	0·8	48·5	21·0	21·0	8·0	1·5	...	...	,, ,,
	,,		Mar. 5, 1917.	Nov., ,,	—	—	90	4,320,000	6,400	1·0	66·0	16·0	13·5	2·5	2·0	...	...	,, ,,
11	K. D.	F	Dec. 7, ,,	Nov. 11, ,,	+ slight.	+	105	6,200,000	12,200	0·8	71·0	8·5	10·0	6·0	3·5	1·0	...	,, ,,
	,,		Mar. 1, 1917.	Nov. 11, ,,	—	+ faint.	85	5,400,000	10,000	0·8	75·5	18·0	1·5	2·0	3·0	...	...	,, ,,
12	W. B.	M	Dec. 7, 1916.	Sept. 21, ,,	+ slight.	+	95	6,100,000	5,800	0·8	38·0	11·5	3·7	8·0	5·5	...	...	,, ,,
	,,		Mar. 1, 1917.	Sept. 21, ,,	+ slight.	+ slight	100	6 000,000	3,200	0·8	53·0	27·0	13·0	6·0	1·0	...	...	,, ,,
13	H. K.	M	Dec. 7, 1916.	Dec. 1, ,,	? slight.	+	95	6,040,000	13,600	0·8	83·0	6·0	5·0	4·0	1·5	0·5	...	,, ,,
	,,		Mar. 1, 1917.	Dec. 1, ,,	No.	+ faint.	110	6,700,000	22,800	0·8	Normal.				...	...	...	,, ,,
14	E. G.	F	Dec. 7, 1916.	Nov. 3, ,,	No.	++	100	5,750,000	7,800	0·8	63·5	12·0	15·0	2·0	6·5	1·0	...	,, ,,
15	E. P.	F	Dec. 11, ,,	Nov., ,,	+++	+++	95	5,100,000	6,000	0·9	50·5	14·0	25·0	6·0	3·5	1·0	...	,, ,,
	,,		Feb. 27, 1917	Nov., ,,	No.	+ faint.	85	4,890,000	3,600	0·8	43·5	15·5	32·5	7·5	1·0	...	...	,, ,,
16	Mrs. C.	F	Jan. 6, ,,	Dec., ,, (5 weeks after ceasing work).	+++	+++	90	5,000,000	8,400	0·9	82·0	9·0	7·0	2·0	...	...	...	,, ,,
17	D. J.	F	Jan. 8, ,,	Jan. 1, 1917.	+ slight.	+	85	4,970,000	7,000	0·85	43·0	27·0	24·0	6·0	...	...	...	,, ,,
18	L. P.	F	Jan. 13, ,,	Never (gastric and cyanosis).	No.	—	70	2,600,000	9,800	1·3	80·0	9·0	4·5	3·5	2·5	1·0	...	,, ,,
19	E. B.	F	Jan. 13, ,,	Never (gastric)	No.	—	95	5,750,000	8,200	0·8	75·0	7·5	8·5	7·5	1·5	...	...	,, ,,
20	L. P.	F	Jan. 29, ,,	Jan. 20, 1917	+++	+++	100	4,750,000	6,800	1·0	77·0	10·0	4·0	7·0	1·0	1·0	...	,, ,,
21	A. S.	F	Feb. 20, ,,	Feb. 13, ,,	+	++	85	4,860,000	8,600	0·9	44·0	17·5	29·0	7·5	2·0	...	...	,, ,,
22	A. J. G.	M	Feb. 24, ,,	Oct., 1916 (severe)	No.	+ very slight	110	7,500,000	5,000	0·6	49·0	29·0	10·5	10·0	1·5	...	...	,, ,,
23	R. F.	M	Mar. 1, ,,	Never (gastric only).	No.	—	95	5,800,000	5,400	0·8	22·0	38·0	26·0	5·0	8·0	1·0	...	,, ,,
24	J. C.	M	Mar. 1, ,,	Never (gastric only).	No.	—	95	5,400,000	5,800	0·8	53·0	27·0	12·0	5·0	3·0	...	...	,, ,,
25	E. G.	F	Mar. 14, ,,	June, 1916 (mild).	No.	—	100	5,675,000	10,800	0·8	57·5	26·5	10·5	4·0	1·5	...	...	,, ,,
26	W.	F	Mar. 14, ,,	July, 1916 (very mild).	No.	—	100	6,000,000	17,000	0·8	73·0	15·5	6·5	2·5	2·5	...	...	,, ,,
27	B.	M	Mar. 14, ,,	Oct., 1916 (very slight).	? slight.	+	100	5,675,000	20,000	0·8	71·0	8·5	9·5	9·5	1·5	...	...	,, ,,
28	W.	M	Mar. 17, ,,	Aug. 17, 1916 (very severe).	No.	—	95+	5,110,000	7,200	0·8	42·5	18·5	24·0	5·5	8·5	1·0	...	,, ,,
29	B.	F	Mar. 17, ,,	Sept. 14, 1916 (very severe).	No.	—	90	5,850,000	4,200	0·8	55·5	17·0	17·5	7·5	2·5	...	...	,, ,,
30	V.	F	Mar. 17, ,,	Sept., 1916 (general, not severe).	No.	+ faint.	100	6,500,000	6,400	0·8	61·0	19·0	6·5	5·5	17·0	1·0	...	,, ,,
31	M. S.	F	Mar. 17, ,,	Aug. 4, 1916 (severe).	No.	+ faint.	85	6,000,000	7,600	0·7	62·5	23·5	8·0	4·5	1·5	...	...	,, ,,
32	Mrs. F.	F	Mar. 17, ,,	Aug., 1916 (eyes only, mild).	No.	+ faint.	90	5,110,000	5,200	0·8	59·0	24·0	12·0	3·0	1·5	0·5	...	,, ,,
33	Mrs. P.	F	Mar. 17, ,,	July, 1916 (general, not severe).	?	+	90	4,770,000	4,400	0·9	65·5	9·0	19·0	4·5	2·0	...	...	,, ,,
34	Mrs. H.	F	Mar. 17, ,,	Aug. 9, 1916 (severe).	No.	+ faint.	100	5,990,000	5,200	0·8	56·0	22·5	16·0	4·0	1·5	...	...	,, ,,

* My = Myeloblast.

1. J. B. still an out-patient at Nottingham, 1.3.17. No evidence of cord changes. No toxic liver changes. Identical with a previous case at the same arsenal. 2. P. C. Typical changes of aplastic anæmia post mortem. 3. H. H. states that she has always been jaundiced and her father also. Possibly a case of hæmolytic icterus, but the present blood condition strongly suggests "aplastic" changes in addition. 4. S. S. now very seriously ill and unlikely to recover. (Died April, 1917). 5. E. K. went steadily downhill and died on Feb. 16th of aplastic anæmia. His liver showed the old scarring of his toxic jaundice attack. On returning to work, he is stated *not* to have handled T.N.T. 6. R. R. still under treatment as an in-patient at the Nottingham General Hospital, March, 1917. 11. K. D. now an out-patient. 12. W. B. still an in-patient. 13. H. K. left hospital Dec. 13th, 1916, and has not worked since. 15. E. P. left hospital Jan. 18th. Still complains of lassitude. 20. L. P. died Feb. 3rd. 22. A. J. G. now recovered, but does not feel fit and is not at work.

know practically nothing. This girl was definitely exposed to "fumes," as also were other cases of aplastic anæmia met with in the course of this investigation. J. E. showed little or no staining of the hands, but was sufficiently in contact with T.N.T. to have absorbed a poisonous dose through the skin.

A very similar case has recently occurred under the care of Dr. Christine Pillman, to whom I am indebted for the following account:—

A. P., a woman working in T.N.T., was admitted to the Royal Free Hospital on Feb. 28th, 1917, with toxic jaundice, and was discharged in April. On May 8th her conjunctivæ were still bile-tinged and she developed a well-marked purpuric eruption. On readmission to the Royal Free Hospital the following blood state was found:—

Red cells 2,800,000 per c.mm.	Colour index ... 0·8.
Hæmoglobin ... 50 per cent.	Leucocytes 4600 per c.mm.

The differential count showed—

	%		%
Polynuclear neutrophils	24·6	Eosinophils	0·6
Lymphocytes	74·6	Mast cells	0·2

The case is evidently one of toxic jaundice followed by aplastic anæmia with purpura.[13]

The following is a summary of the conclusions to be drawn from these cases.

Four severe gastritis cases examined showed no blood changes of importance.

Toxic jaundice and anæmia appear to be separate and independent pathological states.

Anæmia may occur without jaundice and without liver necrosis.

About 17 per cent. of jaundice cases develop anæmia.

The incidence of toxic jaundice is probably overstated, both in medical certificates and in official reports.

In toxic jaundice the fragility of the red cells is altered as in ordinary obstructive or catarrhal jaundice.

A positive Wassermann reaction in a case of toxic jaundice is evidence of syphilitic infection.

Toxic jaundice proper is a long and serious illness, which may persist for nine months, leaving the patient less fit than formerly, and in all probability with a permanently damaged liver.

The jaundice is due to the action of the toxic substance upon the liver and not to hæmolysis.

The type of anæmia produced is that known as aplastic anæmia. It appears to follow destruction of the red marrow, and is to be differentiated from pernicious anæmia.

The latency of the blood changes may be even longer than the latency of the jaundice. The anæmia may develop so long as nine months after ceasing to work in T.N.T.

The anæmia is extremely fatal, and it is still doubtful if any cases recover from it.

The incidence of the anæmia among T.N.T. workers must be very small.

Purpura may develop with the anæmia and a case may first come under observation with hæmorrhage and a purpuric rash.

Finally, certain animal experiments were performed. Attempts were made to reproduce in animals the changes in the liver and other organs associated with jaundice and the blood changes found in human beings. The actual substance responsible for these changes and the mode by which it is introduced into the system is generally held to be trinitrotoluene itself, which is mainly absorbed through the skin. While Professor Benjamin Moore's work on this subject seems almost conclusive, it was felt that every possibility should be investigated in view of the importance of the subject, and bearing in mind the fact that the changes had not as yet been reproduced in animals by the administration of T.N.T. In these experiments T.N.T. was administered to rabbits through the skin by hypodermic inoculation, as also were D.N.B. and ammonium nitrate. Pure NO gas was administered to rabbits and white rats by inhalation over periods of time. It seemed possible that the spacing of the doses of T.N.T. might be of importance, that a considerable dose followed at the appropriate interval by a further dose might sensitise the animal and lead to poisoning, whereas similar daily doses might be tolerated. This point was investigated in these experiments.

The experimental work is not yet concluded, but it may be stated that the results are for the most part negative. Large doses, up to a gramme, of T.N.T. dissolved in toluol can be given to rabbits without any serious effect. Injections of dinitrobenzol were similarly harmless. NO gas given to rabbits and white rats gave rise to cyanosis, drowsiness, and a yellow staining of the fur, but to no other ill-effects. If the percentage of NO gas in the fume-chamber was allowed to rise too high respiratory distress resulted, and in one or two instances dyspnœa remained for several days, but in no case was sufficient of the gas given to produce a fatal pulmonary complication. The animals, even with small quantities of the gas, showed cyanosis and gave a positive Haldane test in the blood. Neither jaundice nor anæmia was induced in any instance.

In the first part of this investigation I received considerable assistance from Dr. Jenkins Oliver and in the latter part from Dr. R. Paddock. My colleague, Dr. S. K. Vaidya, has helped me throughout, and in particular with the routine blood examinations. Physicians at various general hospitals in charge of these patients have freely placed their notes and cases at my disposal. Dr. Jacob, at Nottingham, and Dr. M. G. Thackrah and Dr. J. A. Barnes, in London, have taken much trouble in finding suitable cases for me. Mr. Minter, the works manager of a factory, greatly simplified the work done on his premises. I am particularly indebted to Dr. W. J. O'Donovan for his assistance and advice. All expenses incurred in connexion with the investigation have been defrayed by the Ministry of Munitions and a grant has been further provided by the Medical Research Committee.

[13] This patient has since died (June 19th, 1917), and was found post-mortem by Dr. Spilsbury to have, in addition to a scarred and shrunken liver, the marrow changes of aplastic anæmia.

WAR SURGERY IN SERBIA:

PENETRATING WOUNDS OF THE ABDOMEN.

BY FERGUS ARMSTRONG, M.D. EDIN., F.R.C.S. EDIN.,

LATE MAJOR (SANITATE), SERBIAN ARMY; CHIEF SURGEON, SERBIAN RELIEF FUND'S (LADY PAGET'S) HOSPITAL, USKUB.

THE object of this paper is to make a plea for operation in all cases of perforated intestine due to bullet wounds. Not only does this apply to cases received in the first 16 hours, but also to those received up to 40 hours after injury, and, in fact, to all cases where condition of patient will allow operation.

The cases mentioned were treated by me at Lady Paget's Hospital at Uskub, Serbia, and consisted of Serbians, Macedonians, and Bulgarians wounded during the Serbian retreat in 1915. The hospital was housed in two blocks and three pavilions. The two blocks were newly built cadet schools and in every way up-to-date buildings. The largest number of cases in hospital at one time was 1040. The conditions for operation were as perfect as possible in any Balkan military hospital, fully trained British sisters being in charge of the wards with Austrian and, later, Serbian prisoners acting as orderlies. The patients were all healthy Balkan soldiers, whose resistant power was second to none.

The conditions in the Balkans are such that comparison with surgery on the Western front is not justifiable, and the best comparison is with the South African War. A review of the literature of the first and second Balkan wars shows what a deplorable state of affairs existed.

The only writers mentioning abdominal cases in those wars are Girault and Laurens. Girault passed the month of November, 1912, at Uskub, where our hospital was situated. He states that the wounds were of about eight days' duration when seen at the ambulance after a long transport. Of 120 cases discharged, taken haphazard, he had not one wounded abdomen. At the Serbian Military Hospital installed at the Grad (a hospital which last year was run on English lines by the Wimborne Unit (2nd) of the Serbian Relief Fund) several hundred wounded were under treatment. Girault saw there only one case of wound of the abdomen, and that not a penetrating one. Thus one concludes that *every* case of abdominal wound causing perforation died. Laurens, having passed 11 months in the Balkans, has made analogous observations.

Treatment.

Medical treatment.—The cases not having operative treatment were placed in the sitting Fowler position. Subcutaneous saline was given by Lane's apparatus, as much as six pints in 24 hours in some cases. Pituitary extract and camphor in oil were given. No food, not even fluid, given by mouth for first three days. For restlessness hyoscine 1/150 gr., morphia 1/6 gr., repeated when necessary. Distension is very difficult to treat in general peritonitis; enemata of all kinds were tried, and a flatus tube was used; eserine salicylate hypodermically was found of no appreciable value.

Surgical treatment: 1. *Laparotomy.*—On admission all patients with lesions of intestine were stimulated, for all were in profound shock from exposure on battlefield and delayed transport. After the case had been stripped and put in warm clothing saline was introduced by Lane's apparatus; hyoscine 1/150 gr., morphia 1/6 gr., were also given. In half an hour open ether was administered by the drop method. Never did I allow chloroform in these cases. Anæsthesia was easily produced, owing to state of patient and preliminary scopolomorphine injection.

Incision was through either right or left rectus, or in midline according to site of entrance wound. First I sought for the ileo-cæcal valve and systematically followed the small intestine backwards, bringing each coil out of abdomen for visual examination. Each perforation was sutured with silk by the Czerny-Lembert method. No irrigation of peritoneal cavity. Dry gauze mops and gauze plugging were used to absorb blood and purulent fluid. The exposed coil of intestine was protected by abdominal pads wrung out of hot saline. No clamps were used; an assistant held the perforation on the stretch for suturing. In some cases I put in cigarette drains into peritoneal cavity—one into pouch of Douglas and the other down to most affected coil. The cases that recovered had no drainage-tubes in peritoneal cavity, and I am more and more inclined from results to discard intraperitoneal drainage altogether, except where one has a definite localised abscess. The abdomen was closed in layers with small cigarette drain left down to peritoneum. The wounds always suppurated; this is due to *Bacillus coli*, and so a certain number of antibodies get formed and have a beneficial influence on the underlying general peritonitis.

After-treatment is similar to that described under medical treatment. Most important is subcutaneous saline; it is well to change site of injection from pectoral region to inner surface of thigh alternately. I have given up rectal saline in war hospitals as I find the subcutaneous method much more efficient, and I have not had an abscess or cellulitis at site of needle introduction. Most patients leave the table in better condition than on admission, and cases with no pulse to be felt at commencement of operation have gone to the ward with distinctly perceptible pulse after ether saline stimulation in spite of an extensive operation.

2. *Murphy's operation.*—Murphy, of Chicago, has described excellent results obtained in general peritonitis by this operation, which I practised on one occasion.

Patient wounded 36 hours previously; unsafe to move him into theatre; operation done in bed. About 4 c.c. of 1 per cent. solution of novocain were injected in mid-line suprapubically. Incision 2 inches long through parietes and peritoneum. A rubber tube was then passed down into base of pouch of Douglas. The wound was firmly closed round circumference of tube, where it passed through the parietes, as it is essential not to have any extra-abdominal pressure here. Patient died in 2½ hours.

The intra-abdominal pressure is supposed to cause a free exit of purulent fluid in these cases of general peritonitis. This case is only mentioned as a method of surgical treatment of very bad cases.

Cases.

I. Laparotomy cases of abdominal wounds which showed no perforation of intestine. (Cases 1 and 2; both recovered.)

II. Laparotomy cases (Nos. 3–12) with multiple perforations of intestines of over 30 hours' duration. 7 deaths, 3 recoveries.

CASE 3.—Soldier wounded 32 hours before admission. Entrance and exit wounds showed that bullet had crossed abdomen from right iliac region to left loin. Patient collapsed, pulse imperceptible; abdomen soft and tender in all areas. Laparotomy after half an hour's stimulation by subcutaneous saline. Quantity of blood in peritoneal cavity. Appendix had been amputated by bullet. Eight perforations of small intestine; mesentery punctured in four places. The perforations were sutured and abdomen closed. Death in 14 hours.

An interesting feature of this case was a round worm (*Ascaris lumbricoides*) protruding an inch through a perforation.

CASE 4.—Soldier wounded 39 hours before admission. Entrance wound in left hypochondriac region, exit in left loin. Pulse imperceptible. Abdomen generally tender; no rigidity detected. Laparotomy; five perforations of ileum; general peritonitis marked. Perforations sutured and abdomen closed. Death in 24 hours.

CASE 5.—Soldier wounded 37 hours before admission. Bullet track and condition of patient similar to Case 4. On opening abdomen four perforations of ileum seen. A round worm was seen free in peritoneal cavity, and another had 1 inch of its body protruding through a perforation. Death 60 hours after operation.

CASE 6.—Soldier wounded 34 hours before admission. Entrance and exit wounds showed bullet had crossed abdomen. After saline stimulation immediate laparotomy. Six perforations of small intestine detected. Death on second day after operation.

CASE 7.—Soldier wounded 39 hours before admission. Entrance wound only was seen in umbilical region. Laparotomy; three perforations of small intestine, one of mesentery. Death 60 hours after operation.

CASE 8.—Soldier wounded 35–37 hours before admission. Entrance wound in left lumbar region, exit in right loin. On opening abdomen six perforations of small intestine were detected. Death 14 hours after operation.

CASE 9.—Soldier wounded 32 hours before admission. Entrance wound in left lumbar region, exit to left of third lumbar vertebra. On opening abdomen five perforations of ileum were found. Death in 12 hours.

CASE 10.—Serbian soldier wounded 35 hours before admission by bullet at about 400 yards range. Entrance wound midway between pubes and umbilicus, exit in left loin. On admission patient in profound shock; had walked 12 kilometres and been conveyed 13 in Balkan carriage. Pulse imperceptible. Abdomen slightly distended; very slight tenderness on pressure, but no special area tender; recti not rigid. Laparotomy after preliminary stimulation for half an hour by saline subcutaneously. General peritonitis; four perforations in third foot of ileum (two double perforations about 5 inches apart). On manipulation contents began to escape. The perforations were rapidly sutured, peritoneal cavity closed, and small cigarette drain inserted in parietes. Uneventful recovery, except that parietal wound became septic. Three months later the patient, who had been taken prisoner in hospital by the Bulgarians, was sent to prisoners' compound.

CASE 11.—Soldier admitted 36 hours after wound. Bullet had crossed abdomen antero-posteriorly from left anterior lumbar region. Condition of patient similar to Case 10. Laparotomy; three perforations of small intestine. Perforations sutured and wound closed as in Case 10. Uneventful recovery, except that for three weeks T. was intermittent, as high as 104° at times. It gradually fell, and three months later patient was ready for discharge.

CASE 12.—Soldier admitted 34 hours after bullet wound of abdomen. range unknown. Entrance wound was a fine perforation situated on right linea semilunaris on line joining anterior superior spine and umbilicus; exit wound an inch to left of mid-line posteriorly. Abdomen slightly distended; definite tenderness over right iliac region. General condition of patient bad, but better than in Cases 10 and 11. Pulse felt, but 135 in rate. Complete paralysis of right leg. Laparotomy; two perforations of cæcum in same plane; bullet had entered on anterior and passed out on inner surface. Some weak adhesions present in neighbourhood. The perforations were sutured. No perforations of small intestine discovered. Abdomen closed with tube to parietal peritoneum. Good recovery, although wound suppurated badly. Paralysis of right leg passed off, and 2½ months after operation patient was discharged for convalescence.

In all the above ten cases I believe death would have occurred had there been no interference. The pulse was perceptible on admission in only one case (No. 12). All had suffered from exposure on battle-field and in transport for over 30 hours.

III. Cases (Nos. 13–19) of over 30 hours' duration, due to a bullet wound, treated by abstention treatment. 7 cases, 7 deaths. These cases were consecutive, and were taken as a control to test the abstention treatment as compared with the laparotomy cases, also consecutive.

IV. Case (No. 20) of over 30 hours' duration, treated by Murphy's operation. One case; death in 2½ hours.

V. Two autopsies (Cases 21–22) to demonstrate death due to hæmorrhage.

CASE 21.—Wound received over 30 hours previously. Died in receiving-room in 10 minutes. Autopsy: Bullet had passed through right gastro-epiploic artery of stomach; abdomen filled with blood. Also perforation of stomach at point where artery had been severed. Undoubtedly had this case been operated on within 25 hours of receiving the wound, he would have lived.

VI. Three cases (Nos. 23–25) illustrating rigidity of recti due to injury of diaphragm; all recovered.

VII. One case (No. 26) of abdominal wound, cured spontaneously at home. In this case obviously the bullet had missed the intestine. It is mentioned as a case which the abstentionists would probably have classed as a cure.

Comments.

Out of several thousand wounded all cases of penetrating wounds of abdomen were sent to our hospital, so it is correct to state that all such cases not sent to us died on the battlefield.

Hæmorrhage is the most frequent cause of death in penetrating wounds of the abdomen in the first hours. Cases 21 and 22 are remarkable examples of hæmorrhage from larger vessels (gastro-epiploic and hæmorrhoidal veins) surviving 30 hours.

The round worm (*Ascaris lumbricoides*) was present in Cases 3 and 5. I have not been able to find any reference to such an occurrence. It is a question whether the worm in Case 5 escaped through the perforation during the operation. If it were in the peritoneal cavity immediately after the wound occurred it would constitute a method of spread of peritonitis. It could break down any weak adhesions during its exit, and also it could carry *Bacilli coli* and so inoculate distal parts of the peritoneum. This is pure conjecture, and the opinion of a helminthologist would be interesting. Most people in the Balkans suffer from these parasites, and the matter is therefore of importance.

Intermittent rigidity of the recti muscles is an important sign of an injured diaphragm (Cases 23, 24, and 25). In all, the wounds were such as to coincide with a wound of the diaphragm, and the question arose whether in addition there was any visceral lesion. The cases, seen soon after injury, exhibited an "intermittent rigidity" of both recti lasting

for several minutes, and then the recti would become flaccid for about an hour. This sign passed off after about 36 hours. It is not to be confounded with the rigidity of peritonitis.

Many cases of spontaneous recovery of penetrating wounds of the abdomen have not had a perforation of the intestine. A bullet can cross the abdomen without causing any material damage to the viscera (Cases 1 and 2). The correct treatment of penetrating wounds of the abdomen due to bullet wounds is immediate laparotomy after preliminary stimulation with saline. This treatment ought to be carried out in all cases and at all stages after injury, for recovery may result in the worst cases, even of over 30 hours' duration (Cases 10, 11, and 12). Operation can only be performed successfully in a favourable surgical locale, and each division ought to have a mobile ambulance where such cases can be treated without passing through the various other stations.

Note.—Since writing above I have had the pleasure of seeing the motor operating theatre to be presented to the Italian Army by the Wounded Allies Relief Committee. I was very pleased to hear from Sir William Collins, the designer, that another was being built for the Belgian Army.

SOME OBSERVATIONS ON TRENCH FEVER.

BY E. R. GRIEVESON, M.B., CH.B. EDIN.,
CAPTAIN, R.A.M.C. (T.C.)

MY attention was called insistently to the nature of this disease by having six bouts in two separate attacks of trench fever (hereafter called "T.F.") in May and August of 1916. I had seen some hundreds of cases previously. I observed at that time that it appeared to be infectious, four cases occurring in a single dug-out containing five men, and no cases occurring, so far as I can remember, among the remainder of the men belonging to a group of batteries at that time. Just before my first attack there were a number of cases of catarrhal influenza in the headquarters' mess to which I at first attributed my condition. I was, however, speedily disillusioned by the temperature chart (three days fever, three days no fever) and by the absence of catarrhal symptoms.

At this time, from previous experience, I was of opinion that 90 per cent. of cases of aches and pains in the back and lower limbs with temperature in officers were influenza and 10 per cent. trench fever, while among N.C.O.'s and men the converse ratio obtained. This, of course, was based on the rough provisional diagnosis which a battalion M.O. may well make after seeing a large number of cases. From a subsequent experience I am of opinion that many of the influenza cases were really T.F., while influenza did exist on the Western front. About a month after my first attack I had breathlessness and tachycardia on exertion. For instance, my pulse ran up to 240 after playing a set of tennis, exerting oneself as little as possible. True dilatation was not present and the cardiac condition appeared to both a specialist and myself to be purely nervous in origin. I succeeded, however, in assisting, in the French sense, at the battle of the Somme for two months, being fortunate enough to have the use of a motor cycle or a car for half this period. I became infected again with T.F., and as I found it impossible to walk 20 yards over rough ground without breathlessness I was evacuated to England.

On one matter I held from experience a very clear and firm opinion. With such a heart it is essential to walk slowly and without impedimenta, even a 10 lb. haversack rapidly causing distress, while as long as one walked slowly no ill-effects were felt.

On returning to the front in December, and joining a battalion about the middle of January, with which I remained two months, I observed five cases of T.F. (considering as such the various types otherwise described as X disease, P.U.O., &c.) which occurred in a single dug-out holding eight men, within 16 days, the sixth man having had it previously. Every case had a heart affected similarly to my own, but in less degree.

I suggested provisionally that T.F. should be considered as infectious, early notification, isolation, and, in view of the supposed association with lice, that energetic de-lousing methods should be proceeded with. Major Hurst's paper in the *Journal of the Royal Army Medical Corps* of February, 1916, had not then been published, nor did I see this until the end of March. Owing to the exigencies of the military situation radical measures could not be proceeded with, and I found it necessary to keep a number of T.F. cases in a sick dug-out.

For the first month my records are not as complete as they might be, but on appointing a clerk who was both capable, reliable, and understood scientific and statistical methods, results were obtained which appear to be of some importance. At the end of the first month I found that 40 per cent. of my hospital evacuations were trench fever. We came across then in THE LANCET the record of a single experiment showing that a louse could transmit T.F., the incubation period being 14 or 15 days. Taking this as provisionally probable I set to work to get records of all the men with whom each case coming to me with T.F. symptoms had slept for a month previously. This, owing to battalion arrangements, and owing to the fact that cases grouped themselves markedly in platoons, was easier than was expected, and the evidence of unreliable men could frequently be checked by that of those more reliable.

On March 10th I reported that there was practically no sickness of any importance in the battalion from a military standpoint, with the exception of T.F. and a few cases of diarrhœa. T.F. had by this time so increased that it was now 66 per cent. of all cases (excluding eyes and teeth) coming sick to me.

Trench fever is stated to have been known to the Belgians before trenches formed an unhappy feature of the landscape; it was known to at least one doctor in Serbia in one of the Balkan wars—and, as far as I can discover, at that time was undiagnosed; it was recognised, as Major Hurst records, at Salonica, and known to Austrian troops in the Tyrol and to Germans on the Eastern front. With regard to the general diagnosis I agree with practically all of Major Hurst's conclusions. The essential point to remember, which I verified by subsequent observation in about a hundred cases, is that when a man comes complaining of aches and pains confined to the lower parts of the body, more particularly in the small of the back, and almost certainly down the legs, probably, but not necessarily, in the shins (deep in the bone), with a fairly high temperature at night, looking well, though flushed, with clear eyes, and probably with a tongue which I shall describe later, a history of sudden onset and of more acute pain in the night than in the morning, when trench fever is known to be in the battalion or unit—then the chances against this patient suffering from T.F. are remote in the extreme. As an instance I showed to my C.O. before making an examination a man with an exceptionally healthy appearance, a normal temperature, a smile as he described his agonies of the night before, and his pain in the back resembling the lumbago of unenthusiastic soldiers, and I pointed out how that man might easily be mistaken for a malingerer; but I stated also that he might quite well have a temperature of 103° at night, which actually occurred. The secret of the prophecy lay in the fact that he had a fast pulse, which differed from the malingerer's pulse by remaining fast when his attention was distracted from his ailments.

When I was leaving my battalion, Private Norman Graves, undeterred by either the enemy, or, what was worse, the cold, or, what was worse still, trench fever, with a temperature of 103°, carried the major portion of the work which follows almost to its conclusion.

About one quarter of the trench strength of the battalion suffered from T.F. within approximately two months; about one-half of these were studied carefully, exact records of each being taken in shorthand, and charts showing the time distribution, the platoon distribution, and the bedmate distribution were made, with, in addition, graphs of frequency. Among the companies in the line all had within 22 days practically the same number of cases, with the exception of one company with about 30 per cent. less. This company, curiously enough, differed from the rest in allowing men to sleep, not necessarily in the same groups (which in other companies remained more or less permanent), but more or less as they pleased. As, however, I cannot state to what extent this company had suffered previously owing to the deficiency in the earlier records, nor the extent of the constant redistribution of the men no accurate deduction can be drawn. I believe, however, that the company had suffered previously badly, and, in fact, worse than the others. When

the cases were classified by platoons very striking results occurred. Platoons as such slept together in groups varying from 3 or 4 to 10 or 20, the one in trenches and the other in rest. Certain platoons were found to lose within a month 60 per cent. of their numbers by T.F., while other platoons lost practically none. No difference of conditions could be found in either case. In a number of cases if a man unknown to me came with temperature and aches and pains in the lower half of his body, as soon as he told me his company I would inform him which platoon he was in, subsequently verifying the diagnosis, and in a few cases without consulting my records I managed to tell him with whom he slept a fortnight previously, and conversely my clerk would prophesy in the main correctly who was to be expected on sick parade with the typical symptoms during the next few days. When, however, the cases were studied by their bed-mate groups (to be strictly accurate the definition of a bed might not satisfy purists either of style or comfort) the results were still more striking: for all but a very few cases could be traced to small groups of bedfellows, or rather co-sleepers, so that if a man slept with one group at the approximate time he ran 50 times the chance of getting T.F. than if he had slept with certain other groups in the same companies.

The typical case was as follows:—

A man, or quite frequently a N.C.O., would go sick with T.F. on, for example, Feb. 1st. On Feb. 15th one of his two or three co-sleepers would take T.F. and a day or two afterwards either the whole three, or two, of his co-sleepers would fall sick. The same thing would happen when the first case occurred in rest billets, but then only a certain proportion of his co-sleepers would fall victims out of the larger group. On this date, the 15th, he would himself fall sick again—in many cases. In such an event the original case having returned to his fellow-sleepers, or rather to what remained of them, or finding other bed-mates, he (typically) would infect them and they would fall sick on March 1st, on which date he might possibly have another attack, or not. In either case a certain proportion of his co-sleepers would fall sick on March 15th, one generally to the day, the others a day or two afterwards. All these cases were liable to infect new co-sleepers, and some of these co-sleepers would fall sick 14 days later. It must be stated frankly that the isolation of the cases was not such that other possibilities of infection were fully excluded, but from the study of the whole number of cases no other conclusion was possible than that T.F. has an incubation period of 14 days, possibly plus or minus one day.

So marked was the infectivity that out of all the platoons in the line one half had six and a half times as many cases as the other half, though men were occasionally transferred from one platoon to another. The crucial point that the blanket-mate was immediately infected while other co-sleepers were infected a day or two later lacked sufficient evidence to prove it; but it appears to me sufficiently probable that the disease may well be called "blanket-mate fever," though even the blanket may in some cases be missing. As to the carriage by lice, no other conclusion could be arrived at, leaving out of account the recent alleged discovery of the spirochæte in the louse. While obviously infectious in my series of cases T.F. is practically non-infectious in England; is much less infectious under better conditions a few miles behind the line than in the line itself, and varies roughly in infectivity in proportion to contiguity.

It is well known to men, but not always to the authorities, that under cold conditions blankets are practically always shared by adjacent men in the line; that under rough conditions behind the line this also occurs, while under comfortable conditions this does not occur. As to the travelling capacity of the louse, so much is this believed in that many men are convinced that the louse has a special predilection for non-lousy men, so that if a clean man sleeps with lousy men even for a single night he is at once singled out for attack by a raiding party. This, however, is a fallacy. The better class of men (if lousy at all) catch on the average from 3 to 10 lice a day, and generally obtain a night's rest as a result of their exertions, while the less enthusiastic or more pessimistic men catch none, and harbour from 20 to 1000 lice. It is obvious that a few lice travelling from a very lousy man will be more noticed by a non-lousy man or slightly lousy man than by one who is "crawling." Bearing in mind that only a proportion of lice are infected with the virus, I found the distribution of T.F. far more closely following the general distribution of lice than of any other probable cause; for instance, officers suffer less than men, and when single cases occur among officers T.F. does not become markedly epidemic among them.

The transport was practically non-lousy, and only a single case occurred in two months. Headquarters company, under better conditions than the rest, had one-tenth of the expectation, according to company distribution. I found them fairly free from lice.

As to the question of over-work causing T.F., my observations are by no means in harmony with this. Nor is the distribution of T.F. *pari passu* with the fatigue of individual men or individual groups. T.F. attacked alike those who had responded to the call of Lord Kitchener and those who gave a somewhat less energetic response to that of Lord Derby. The number of cases during the exceedingly cold weather of February was larger than that during the damp and sloppy weather of January, while other illnesses decreased. Non-commissioned officers, too, who are somewhat less exposed to fatigue than men were attacked at least as freely as the men, and in some cases more so. The explanation of the belief that exposure is an essential is that when exposure occurs men share blankets and sleep closer to one another. When over-fatigue occurs not only are official methods of de-lousing apt to be postponed but the men themselves pay less attention to de-lousing themselves by their own methods. As these require about an hour a day, as the hunter will assure you, it is natural to find them omitted

Against the louse-borne theory there are the following facts: N.C.O.'s are at least as liable to T.F. as men, and while, as Peacock shows, 95 per cent. of the infantry are lousy, this percentage does not hold with N.C.O.'s as a rule.

As for myself, I have never found a louse on myself or my clothing, and in view of these facts the following is put forward speculatively as an explanation. Apparently there is an immunity to louse-bites as opposed to lousiness. In a number of battalions where 90 to 99 per cent. of the men admit some lousiness I have repeatedly found that only 5 to 10 per cent. show obvious marks of louse-bites. If such an immunity exists, and such immunity is only partial, a single infected louse may infect a fairly immune man, while a man who harbours 50 to 1000 lice does not increase his liability in the same proportion, in view of the fact that the sources from which he draws his lice are frequently more restricted than that of the N.C.O.'s.

The explanation of the cases, of which I have a fair number, re-infecting themselves after 14 days has yet to be sought. The type is apparently essentially a carrier. He starts the trouble in several of my instances, and infects one other, as a rule, exactly 14 days after the date of his first attack, others a day or two afterwards, and in odd instances he is found to be again feverish 28 days after his original attack.

The tongue of trench fever, which I have not seen previously described, occurs typically on the first day, is very marked during the pyrexial period, occurs in perhaps 80 per cent. of cases, remains as a rule during the first week or two, and can sometimes be recognised as much as three months afterwards. It is characterised by a red margin $\frac{1}{4}$ to $\frac{1}{2}$ of an inch wide, with a thick and bright yellow fur covering the rest: this fur during apyrexia may be dull and slightly brownish in appearance, especially in those of bilious temperament. The arterioles on the side of the tongue may be markedly injected. So characteristic is this tongue that stretcher-bearers, whose virtues were military rather than medical, would frequently make a provisional diagnosis for my information which I subsequently confirmed.

As to the sequelæ of T.F. the most important observed were anæmia and disordered action of the heart. The anæmia comes on in about 10 to 15 per cent. of cases, the intensity and duration of the preliminary fever bearing a certain relation to this. One or two cases were observed where good keen men had "stuck it," doing their duty in the trenches with night temperatures up to 102°. One such, an orderly corporal, who would not go sick during the first three days, though with the fever and weakness he could barely walk, was observed, and at any time up to three weeks afterwards could be recognised as anæmic, by those who knew him, at a distance of 50 yards.

Tachycardia is, as far as could be observed, practically always to be found in these cases. The importance of

it and dyspnœa from a standpoint of battalion efficiency is very marked, for we give no information to the enemy in stating that more than three-fourths of modern warfare is sheer hard labour. The same type of effect is probably produced by the sequelæ of T.F. as is produced by malaria in tropical countries among military expeditions. Willing, keen men are unable to do their work for physical reasons, and from the sense of undue over-exertion become depressed in mind. T.F. itself and its sequelæ do not appear *directly* to cause depression of spirits to any marked extent in the later stages. Officers, for instance, complain little of this, their chief complaint being that they feel the cold badly. Men who have borne reputation for ability to avoid the trenches are in some cases chronic mild trench fever cases, who by their ingenuity in inventing symptoms have failed to receive attention for their real disease. The temperature, however, is slightly raised, the typical tongue is often present, and the pains mild and diffused but real. When they are reduced to telling the truth a previous history of T.F., generally fairly acute at the outset, is obtained, and the type appears to be the 14-day type, and they seem to be carriers.

As to treatment, sedatives appear useful and massage, in my opinion, concentrates the attention like massed artillery upon the aching shins, and malingering may easily be produced. The pains appear to bear very fairly exact ratio to the temperature. Patients seem to do well either staying in bed or taking exercise, but moping all day in an attitude of depression is bad.

A clear understanding that the disease runs its course, carrying with it some to "Blighty," and none to a better world than that—that the painless period of apyrexia may continue indefinitely, and if it does not the pain will certainly be less than before, will do more to assure and relieve the vast majority of patients than anything else.

I have frequently tried to verify the statement that the temperature may go up suddenly as a result of exposure to cold. While it may occur I found no evidence of it even in the early stages of the disease. I do not see, *pace* the cardiac specialist, that the tachycardiac case should not take on the duty of a sentry even with this condition. Sergeants, for instance, are able to carry on for a considerable period with very marked tachycardia, and are apparently unaware that they suffer from it until they exert themselves unduly, as in training.

The T.F. man is not liable to feel the cold unduly provided he is well wrapped up, and displays a little intelligence; with the cöoperation of the cooks, bricks can be heated, covered with sandbags, and placed between the blankets, even within earshot of the enemy. (Such bricks will remain warm for about three hours and can be used successfully for wounded men either when waiting to be dressed or during transport down the trenches.)

The alternative to such a use of men as this is months of rest and light duty. Unhappy and painful meditations as to whether the sergeant in charge has given one too much work for light duty constitutes sometimes the major portion of the work done. From my own and a few other cases it appears that the cardiac condition tends to cure itself in time, nature being the best guide as to the maximum of exertion advisable. There must be no tall peaks on the graphs of the curves of energy expended per minute or per hour, but without impedimenta and with suitable intervals of rest it is quite possible for such a case to cover 10 to 15 miles in a day on good ground, without distress or apparent harm even with a pulse of 240 on undue exertion.

In view of the incidence of this disease and the nature of its sequelæ it is of grave import from a military standpoint. Captain Muir shows[1] that in eight successive months, while a division was actively engaged, 350 cases per month were sent to the three field ambulances; add to these the D.A.H.'s derived from T.F. cases but only admitted as D.A.H., and add, too, the undiagnosed cases (and such form a large number, I believe), and you have a morbidity rate which can only be equalled by such plagues as typhus, or as typhoid formerly, or as malaria.

As to prophylaxis, I cannot do better than quote from Major Hurst: "As the disease is probably conveyed by lice, which become infected by biting a patient during an attack, every effort should be made to keep troops free from them. All cases of T.F. should either be sent to hospital or isolated, and the patient's clothes and bedding should be specially disinfected as well as that of men who have recently slept near him, and after the initial or second attack a man is often able to return to duty. It is very important that he should be kept under observation, and if he again becomes verminous his clothes and bedding should again be disinfected. Men who are still having attacks or have recently recovered should sleep together, isolated from the other men in their unit, but there is no reason why they should not work with them."

To this I am only anxious to add that the value should be insisted on of early diagnosis, notification, and isolation in hospital.

[1] Brit. Med. Jour., Nov. 11th, 1916.

THE PRE-MENINGITIC RASH OF CEREBRO-SPINAL FEVER.

BY C. P. SYMONDS, M.R.C.P. LOND., M.R.C.S.,
TEMPORARY CAPTAIN, R.A.M.C.

VARIOUS observers[1] have noted that there may be an erythematous rash in cerebro-spinal fever—Rolleston[2] in a recently published series of 95 cases mentioned it as occurring in 5, whilst in another 5 there was a so-called rose rash; but no one, so far as I am aware, has remarked upon the time relations of this eruption to (*a*) the onset of the illness, and (*b*) the first symptoms of meningitis. In a fair experience of the disease (about 50 cases) I have in 3 cases seen this erythematous rash; it was in each instance observed very early after the onset, and before there were any symptoms of meningitis to suggest the diagnosis, so that it is perhaps worth recording the details.

CASE 1.—Private T., aged 32 years, had been in hospital for five days with dyspepsia; there were no physical signs of organic disease. At 2 A.M. he woke up with a fit of shivering, complained of headache, vomited, and was restless. His temperature later in the morning was 102°F., and when examined at 10 A.M. he showed a profuse rash on the chest, abdomen, and back. This consisted of erythematous spots of about the size of the finger-nail, which faded on pressure, and were just distinctly papular to the touch. There were no physical signs except a little sticky pharyngitis. Kernig's sign and neck stiffness were looked for, and were not present. Later in the morning this rash began to fade on the trunk and to appear on the legs and arms, and by 2 P.M. had disappeared entirely.

At 3 P.M. the patient was examined by a consulting physician and neurologist, who suggested malaria as a possible diagnosis. He was next seen at 5 P.M., when he was irritable, complained of pain in the back of the neck, and showed a positive Kernig's sign. Lumbar puncture performed at 7 P.M. yielded fairly turbid fluid under pressure, containing meningococci and pus cells.

CASE 2.—Cadet B. was admitted to hospital one morning for acute tonsillitis of two or three days' standing. He had a temperature of 100° F. and a rapid pulse. There was a sticky greyish exudate on the fauces, extending on to the soft palate, and the question of diphtheria was raised in diagnosis. There were no signs of meningitis present either on admission or on the evening of the same day.

At about 6 A.M. on the following day an erythematous rash was noticed on the trunk, and the patient was seen by a medical officer, who ordered him to be treated with precautions as a possible case of measles. At 10 A.M. the rash was fading on the trunk but well marked on the limbs, including the palms of the hands and the soles of the feet. The individual spots were distinctly raised and averaged about the size of a threepenny-piece. The mental condition was rather confused, but there were no definite signs of meningitis. At 1 P.M. there was a little neck stiffness and a doubtful Kernig's sign, and the spots were now fading from the hands and feet.

Lumbar puncture was performed and a faintly opalescent fluid was obtained, which on standing showed a fine fibrinous clot containing meningococci.

CASE 3.—2nd A.M. L. was taken suddenly ill in the middle of the night and admitted to hospital next day at 1 P.M. The medical officer on duty found that he had a temperature of 100° F. and an erythematous rash on the trunk which suggested measles. He examined the patient for signs of meningitis, which were not present. At 7 P.M. the erythematous spots had vanished from the trunk, but there were a few present on the hands and feet which were already fading. In addition there were now present on the trunk and limbs fine scattered spots typical of cerebro-spinal fever, the patient was confused and incoherent, and neck stiffness and Kernig's sign were both definitely present.

The cerebro-spinal fluid was turbid and contained pus and meningococci in large numbers.

In Case 1, where the patient was under observation from the onset, there was a profuse rash to be seen six hours later, which had disappeared four hours after it had first been observed. In Case 3 the erythematous rash was present 12 hours after the onset and had almost disappeared six hours later. In Case 2 the probability is that there was primarily a local meningococcal infection of the throat and naso-pharynx, and that this became a general infection after

[1] Osler's Medicine. [2] THE LANCET, 1917, i., 55.

the patient's admission to hospital. Probably therefore in all three cases the rash had made its appearance and faded away within 24 hours of the onset of the general infection, and it was certainly a striking feature of each case before meningeal symptoms suggested the diagnosis.

These cases tend to confirm the hypothesis put forward by Lundie, Maclagan,[3] and others that there is a septicæmic stage in cerebro-spinal fever which precedes the meningitis, and fall into line with a most interesting case[4] recently reported in THE LANCET in which agglutination tests afforded evidence to show that an infection of acute onset with an early rash, similar to that described above, was a meningococcal septicæmia which had stopped short of meningitis.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

PURPURIC AND CEREBRAL SYMPTOMS OCCURRING IN THE DEFERVESCENCE OF ENGLISH MEASLES: TWO FATAL CASES.

BY T. GODDARD NICHOLSON, M.B., B.Sc. LOND.

THE invasion of morbilli is often accompanied by grave disturbances of the hæmic and nervous systems, but occurrence of these serious lesions after the defervescence is not so well recognised.

CASE 1. *Purpura, convulsions, and mental symptoms following defervescence: recovery.*—A youth, aged 17 years, whose fever and rash had subsided on the fifth day after the first appearance of the severe eruption and who seemed to be well in the afternoon of that day, became suddenly unconscious at 7 P.M. He fell over on his right side, breathing stertorously, and convulsions affecting the whole body soon succeeded. These spasms lasted with but short remissions for 15 minutes. At the end of this period he was easily roused, but appeared terrified, as he could not see. The pupils were semi-dilated, but no optic neuritis or hæmorrhages in the retina were detected, the knee-jerks and the other reflexes were normal. Synchronously with the unconsciousness a coarse purpuric rash appeared on the face and neck, which quickly spread over his whole body. Within an hour of his seizure the youth became very restless, delirious, and made violent attempts to get out of bed, while "insanity of location" developed. Hyoscine hydrobromide 1/100 grain, morphine hydrochloride ¼ grain, were injected, determining tranquillity and a peaceful sleep, which lasted for 14 hours.

On awakening a condition allied to that of "cerebral irritation" after head concussion had developed. In this condition he remained for four days, when, with the fading of the purpuric rash, he recovered completely. Retention of urine and incontinence of fæces accompanied the mental symptoms. A marked retraction of the head on the first day after the seizure, coupled with Kernig's sign, determined a lumbar puncture, but the clear fluid obtained was normal to both chemical and microscopic tests.

On his recovery the patient had no recollection whatever of his attack, nor of any events occurring while mental aberration obtained, but he recollected the transient blindness at the incidence. On the nineteenth day after the appearance of the measles rash he was quite well.

CASE 2. *Mental disturbance after defervescence; recurring hæmatemesis; death.*—A youth, aged 15 years, on the second day after the severe measles rash had developed, and when it had begun to fade and the temperature had fallen to 100·8° F., commenced vomiting food with altered blood. A persistent hæmatemesis ensued, accompanied by severe constant pain over the fundus of the stomach, which was not distended, nor were any signs of perforation present. The obstinate vomiting was uncontrollable by drugs and caused great exhaustion, but ceased after 80 hours.

Soon after the incidence of the emesis the fading rash became much duskier, while the boy became delirious, restless, and lost his orientation power. With the cessation of the vomiting the mental condition became normal, the appetite returned, and food was retained. Except for a slight bronchitis he seemed well, and on the sixth day after the first sign of rash the temperature fell to normal. However, on the following day persistent hæmatemesis with great pain over the fundus recurred with a gradually rising temperature. The boy became cyanosed and collapsed, while the temperature rose to 105° F., and despite the exhibition of warm oxygen and cardiac stimulants he died of heart failure on the eighth day following the morbillar eruption.

CASE 3. *Mental symptoms complicating defervescence.*—A youth, aged 17 years, whose temperature and pulse had fallen to normal on the sixth day following that of the eruption, became on that day delirious, restless, and affected by "insanity of location." After persisting for 48 hours, without any febrile developments, he fell asleep and after a quiet night woke up in a normal condition. He suffered no other complication and was discharged well on the sixteenth day after the development of the rash.

CASE 4. *Mental symptoms with the defervescence, accentuating later and followed by acute appendicitis; recovery.*—A well-developed male, aged 39 years, showed marked restlessness as his acute rash faded and the temperature and pulse subsided on the fourth day after the eruption showed itself. On the fifth day, while the temperature and pulse were normal, great restlessness associated with delusions of persecution and "insanity of location" developed. Persistent insomnia was unaffected by repeated doses of hyoscine and other hypnotics and the patient remained insane for three days. Incontinence of urine was nocturnal only. At the end of the eighth day he seemed to be quite recovered and kept well until the sixteenth day from the rash, when he complained of abdominal pain and again became slightly delirious. Acute appendicitis was diagnosed and a successful operation was followed by a complete recovery. Both ether and chloroform were used for a prolonged anæsthesia (1½ hours), but no further mental symptoms occurred.

CASE 5. *Broncho-pneumonia accompanying the eruption, followed by mental symptoms, tremor, paralysis, and death.*—A male, aged 21, presenting some signs of "giantism," developed a severe measles rash which had faded on the third day, although accompanied by a broncho-pneumonia. On the sixth day following the rash the patient became restless and slightly delirious. These symptoms increased during the following three days, but the chest signs were not serious. On the ninth day following the eruption a very marked restlessness and nervous anxiety as to his own condition developed, although the pulse was good and the bronchitis had diminished, while retention of urine and incontinence of fæces obtained. The delirium increased, and a marked coarse tremor with slight rigidity affected both upper and lower limbs and the jaw. This state persisted for two days, when retraction of the head, absence of both knee-jerks, and well-defined Kernig's sign determined a lumbar puncture, though there was no optic neuritis. The cerebro spinal fluid was under no increased pressure, and both chemically and microscopically was normal.

The tremor increased considerably, and one or two convulsive seizures occurred before he became unconscious and died of heart failure on the twelfth day following the measles eruption. In this case the temperature never fell below 101° F. from the fourth day of the rash, and remained above 102° thence on till death. After death the rectal temperature was 104·5°.

The autopsy showed a mild broncho-pneumonia, some injection of the grey matter, and slight enlargement of the pituitary body.

Two other cases showing similar symptoms to Case 3 occurred subsequently.

Dr. Charles R. Box and Sir John Broadbent have suggested that these cases should be published to afford some starting point for future workers.

London Fever Hospital, N.

NOTE OF A CASE OF RECOVERY AFTER THROMBOSIS OF THE SUPERIOR VENA CAVA.

By MARY I. HOUNSFIELD, M.R.C.S., L.R.C.P.,
HOUSE PHYSICIAN, ROYAL DEVON AND EXETER HOSPITAL.

THE fact that recovery has taken place renders the following case of interest.

Patient, aged 42, a nurse in an institution, on Feb. 15th, 1917, while on night duty, was suddenly taken ill and vomited twice. She noticed then that her face was very blue. She continued on duty for three nights and then went to bed for three weeks, after which she was admitted to the Royal Devon and Exeter Hospital, Exeter, under the care of Dr. W. Gordon. On admission her face was cyanosed. All the superficial veins of head, neck, and upper part of chest were dilated and engorged. Venules were dilated down to the costal margin. Face, neck, and upper chest were much swollen, but there was no pitting on pressure and no œdema of the eyelids. The swelling gradually subsided with rest in bed, but the veins remain somewhat dilated and cyanosis of the face recurs from time to time. Very marked transient cyanosis after slight exertion on April 14th.

Clinical examination of the chest revealed nothing abnormal, except a localised musical systolic murmur to the right of the lower end of the sternum on admission. This murmur soon disappeared. The right kidney was unusually palpable, abdomen otherwise normal. No enlarged cervical or axillary glands. No tumour of breast. No œdema elsewhere. Urine normal. Blood count normal. A very thorough radioscopic examination of the chest was made early in April, and absolutely no evidence of aneurysm, mediastinal glands, or tumour of any sort could be found.

Examination has thus excluded any cause of external pressure on the superior vena cava, and the only diagnosis possible is some internal obstruction, probably thrombosis. Slight dilatation of the veins still persists, but the patient feels well and is anxious to return to work.

The case is reported by permission of Dr. Gordon.

HOSPITAL SUNDAY FUND AT BRISTOL.—The Hospital Sunday Fund collections in Bristol for 1917 amounted to £3000. This is a record, and the Lord Mayor of Bristol (Dr. Barclay Baron) was congratulated by the members of the committee on the result of his efforts. £2800 have been given to the larger medical charities and the balance allocated to the smaller medical institutions. The Royal Infirmary received £1218, which is more than the whole collection for the first year of the Fund (1899).

[3] THE LANCET, 1916, ii., 1054. [4] THE LANCET, 1916, ii., 1010.

JOURNALS.

The Philippine Journal of Science, Section B, Tropical Medicine, Vol. XI., No. 4.—This number contains three articles, the first of which is by Dr. Otto Schöbl, who describes some experiments on the relation between the amount of cholera culture injected into the gall-bladder and the state of cholera carriers in experimental animals. His conclusions are that the inoculation of a relatively small amount of cholera vibrios into the gall-bladder may produce carriers in animals, but the results are not as regular as they are when larger amounts are used for the inoculation; the amount of the inoculated material does not seem to have any direct bearing on the duration of the carrier state in animals according to his experiments. Dr. Schöbl also contributes a short article on the influence of bile upon the duration of the state of cholera carriers in experimental animals. The object of his investigation was to gain information with regard to the relation of cholagogues to the state of cholera carriers, and as a result he found that the increased flow of bile does not further the disappearance of the cholera vibrios from the gall-passages and from the intestine. On the contrary, his experiments "seem strongly to indicate that the administration of bile, a cholagogue *par excellence*, tends to prolong rather than to shorten the duration of the state of cholera carrier." The third article is contributed by Dr. H. Windsor Wade, who discusses Carbohydrate Fermentation by *Bacillus Pestis*, comparing certain American strains from New Orleans and Oriental strains from the Philippine Islands; he gives also an analysis of discrepancies of fermentation with Hiss's serum-water, litmus-agar, and bouillon. Ten strains of *B. pestis* were employed, and comparison failed to demonstrate any distinct difference, qualitative or quantitative, between fermentative activities of Philippine strains and those from New Orleans. There was, on the other hand, a rather remarkable agreement between the different strains except with regard to glycerine fermentation. He found veal-infusion the most suitable medium for carbohydrate fermentation of *B. pestis* Litmus-agar was more favourable than Hiss's serum-water unmodified, the latter being quite unsuitable. The types of media and the different sugars used had various effects, some of which were very definite and constant, on the amount of growth and on the morphology of the organism.

The British Journal of Ophthalmology, Vol. I., Nos. 4, 5, and 6 (April, May, and June).—These numbers of the *British Journal of Ophthalmology* contain, in three parts, a most important paper on bitemporal hemiopia, the later stages and the special features of the scotoma, by H. M. Traquair. Dr. Traquair has devoted an immense amount of care and attention to the finer details of the scotomata found in cases of bitemporal hemianopia due to involvement of the chiasma and optic tracts, whether caused by disease of the pituitary body or other mechanism. He has mapped out the relative scotomata which are so common in these cases, employing a method of great delicacy, modified by himself from the methods generally in use. Physicians and surgeons alike meet with cases of acromegaly, pituitary disease, and other conditions in which bitemporal hemianopia is a prominent symptom. They cannot afford to ignore this paper, which, in addition to examining the current theories of the mechanism of production of the field defects and providing an excellent bibliography of the subject, adds details of considerable value to our knowledge. Amongst the prominent ophthalmologists who have recently died are Mr. W. H. H. Jessop and Dr. Wendell Reber, of Philadelphia. These numbers contain a biographical notice of the former and an illuminating paper on some phases of modern ocular therapeutics by the latter. Dr. Reber discusses such matters as subconjunctival injections, hormone or organo-therapy, vaccine and serum therapy, and so on. His extensive practical experience and his well-balanced judgment shield him from undue pessimism as well as from excess of enthusiasm. In his own words, he is neither "over-enthusiastic about the qualities of the new, nor iconoclastic regarding the therapeutic ideals of olden days." Other papers which may be mentioned as containing specially helpful material or new facts are those on the Retinal Signs of Arteriosclerosis compared with those due simply to Increased Blood Pressure, by P. C. Bardsley; Three Cases of Fur Infection of the Conjunctiva from Cats, by Arnold Lawson; a New Operation for Ptosis, by Ernest E. Maddox; the Tonometer of Sciötz, by Bernard Cridland. There are other papers of value, and there is a wealth of information in the abstracts derived from ophthalmic literature published elsewhere. An addition is made to the series of British Masters of Ophthalmology in the biography of Benjamin Travers, F.R.S., by Percy Dunn. This paper is illustrated by a portrait.

Military Surgeon.—The June number of this journal gives the first place to a lecture by Colonel T. H. Goodwin, C.M.G., D.S.O., R.A.M.C., on the Collection and Evacuation of Wounded, one of a course of lectures given at the U.S. Army Medical School on the entry of the United States into the war. A paper by Colonel George E. Bushnell, Medical Corps, U.S. Army, on the Diagnosis of Tuberculosis in the Army, dwells on the importance of accurate diagnosis at the present time in the United States when civilian examiners, accustomed to accept as true the statements of patients, have to decide the degree of health of three classes of men: (1) those who suspect they are tuberculous, but are anxious to become soldiers; (2) those who are tuberculous but are anxious to join the Army and secure treatment and pension; (3) those who are not tuberculous but are anxious to evade military service and will allege non-existent symptoms and misleading histories. The paper is long and careful. The writer, who is in charge of a large army sanatorium and has been giving special attention to tuberculosis for several years, seems to feel that, so far as reliance can be placed on a single sign, that sign is the râle—a judgment in which he claims to be supported by German experience during the war.—Lieutenant-Colonel E. L. Munson publishes the first part of the history of an epidemic of measles in a division of 14,000 men in Texas. The epidemic arose from the civil population; its outbreak in the army was foreseen and minimised by careful precaution. Much success was attained; greater could have been achieved had the discipline of the army been better, since "discipline is the mainspring behind sanitation." Colonel Munson was guided in his precautions by his conviction that measles is incorrectly classed as an eruptive fever, whereas it is really a respiratory disease with a rash as a sequela, and he very generally succeeded in isolating patients before the rash appeared. 11,000 well-disciplined and obedient troops showed 105 cases (about 10 per 1000); the other 2400 had 339 cases (about 140 per 1000). To put the same thing in another way, the less well-disciplined troops, had they had the same "luck" as their brethren, should have escaped with 22 cases, but they got 339; while the well-disciplined troops, who might have had some 1500 cases, as compensation for their self-submission to discipline, got off with 105 cases. Their obedience to discipline saved nearly 1500 men from disease and certain of them, no doubt, from death. Other papers evidence the increasing respect for sanitary precautions in the minds of military administrators in the United States, and we note that the time of medical officers is being more and more saved by the assignment to them individually of clerks to do the paper work—in recruiting duty, for example. Attention is prominently drawn to the happy result of the preparedness campaign amongst the medical profession in the United States in recent years. The medical profession there has been doing while others have been talking, and now they are in consequence "first at the front," and were ready to take over, and did actually take over, the management of certain hospitals in France as soon as war was declared—a fact which does them much credit.

MEDICO-PSYCHOLOGICAL ASSOCIATION OF GREAT BRITAIN AND IRELAND.—The seventy-sixth annual meeting of the association will be held on Wednesday, July 25th, at 11, Chandos-street, Cavendish-square, London, W., at 2.45 P.M., Lieutenant-Colonel David G. Thomson, R.A.M.C., presiding. The Educational and Parliamentary committees of the society and the Council will meet on the same day. The following have been recommended for the Research Committee by the Nominations Committee and have been approved by the Council:—T. Stewart Adair, J. Shaw Bolton, J. Chambers, M. A. Collins (*ex-officio*), H. Devine, T. Drapes, E. Goodall, John Keay, J. R. Lord, H. Hayes Newington, David Orr, Ford Robertson, R. G. Rows, R. Percy Smith, R. H. Steen, D. G. Thomson (*ex-officio*), W. J. Tulloch. A paper on Madness and Unsoundness of Mind, by Dr. Mercier, will, in the unavoidable absence of the writer, be read by Sir Bryan Donkin.

THE LANCET.

LONDON: SATURDAY, JULY 21, 1917.

In the Interest of the War Cripple.

THE number of permanent war cripples was recently estimated by a public servant at 200,000, and their care has entered upon a new phase with the dissolution of the Central War Pensions Statutory Committee and the taking over of its work by the Ministry of Pensions. The country has been divided up into areas for purposes of collective administration and, as usual, Lancashire is well forward with a scheme, which we summarise on p. 99, for a Central Bureau for organising the work of rehabilitation and re-education of the discharged cripple. It is still not clear—perhaps it never will be—how the Ministry of Pensions and the War Office propose to share their various obligations, but the Paris Conference indicated definitely and authoritatively what those obligations are likely to be, and we have now received from our Paris Correspondent the full text of the resolutions passed by this Conference in plenary session, more than 100 in number. The first group of these deals with the restoration of function and the essential recommendations can be summarised as follows: The earlier evacuation of the wounded man into an institute of physio-therapy; the provision of a sufficient number of well-equipped institutes with competent trained personnel; the attachment of an orthopædic surgeon to each field ambulance; the earliest possible application of medical gymnastics. These are the things placed in the forefront of desirability. And it is on lines such as these that permanent impairment of function will be reduced to a minimum by appropriate anticipatory treatment. The remaining resolutions deal more especially with the treatment of any abiding disabilities by re-education, and their wide scope demands close attention. Their purpose—namely, to develop a common policy towards the war cripple among the Allied nations—is worthy of all support.

The possibilities of hope and usefulness opened up to disabled men by the new methods of care and re-education cannot be made too widely known, and we therefore welcome a new and powerful agent in publicity in the shape of a journal, entitled "*Recalled to Life*," edited by Lord CHARNWOOD, of which the first number (June, 1917) has recently appeared. The purpose of this journal is stated to be the diffusion of information among those concerned with the welfare of disabled sailors and soldiers, and not less among the men themselves, concerning the means by which they may be restored. This end will be furthered by a lucid summary of the Treatment of the Disabled from the pen of Sir ALFRED KEOGH, Director-General of the Army Medical Service, prepared for the Anglo-Belgian Committee, and reprinted in this first number of *Recalled to Life*. After an informing historical introduction, Sir ALFRED KEOGH sketches in stages the history of the sick or wounded man who has been declared to be unfit for further military service, going on to deal in detail with curative workshops and with the special problems of the blind and deaf. Accurate knowledge will undoubtedly be the best means of correcting any misconceptions which exist in the minds of the disabled or partially disabled sailors or soldiers with regard to their training. The introduction to the journal records the persistence of the curious belief among the men, prevalent especially in France, that the disablement pension will be taken away from them in proportion to their return to industrial efficiency. Even in Germany this appears not to be the case, and in this country a pension once awarded can never be taken away or diminished. The only fact to be determined on pension revision is whether physical disability has been reduced by treatment; the question of earning capacity does not arise. This is a message which the medical profession should convey clearly to their charges.

Not only can the pension not be taken away, but the disabled man cannot be compelled by the State to learn the trade or to follow the pursuit which will restore him to his highest possible degree of vitality. Only moral suasion can be used for his betterment, and the conviction brought home to the disabled sailor or soldier that he is not less of a man, but more of a man, than he was before the war, unless he decides otherwise himself. Colonel Sir ROBERT JONES, Military Inspector of Orthopædics, who contributes an article in *Recalled to Life* on Orthopædic Surgery and the War, lays great stress on the effect of the curative workshop on the wounded man's mental outlook. In an atmosphere of work, he says, the man who has lost in hospital much of his spirit and initiative soon recovers some hold on himself, ceasing to think so much of himself as a maimed man, but rather of what he will be able to do in the future. That this spirit is not necessarily lost in hospital is testified to by an admirable special number of the *Gazette* of the 3rd London General Hospital, entitled "Happy—though Wounded!" edited by Lieutenant-Corporal WARD MUIR, R.A.M.C., and brimful of humour. The Editor tells us that one of the most amusing articles was penned by a sergeant just before undergoing an operation which he knew might be fatal. This is typical of the spirit which is common to all the fighting forces, and is the material on which medical care and re-education will not be brought to bear in vain. It is the duty of the country to reward this gallant spirit by striving in every way to help in the rehabilitation of our heroes. The medical profession, which has learned vast new lessons in the course of the war, is restoring to our population thousands who, a generation ago, must have been doomed to hopeless, helpless crippledom; adequate organisation for giving to these men the chance of using their recovered faculties must be forthcoming.

The Medical Recruiting Boards.

WE have published from week to week the evidence given before the Select Committee of the House of Commons which is holding an inquiry into the working of the Military Service (Review of Exceptions) Act, an inquiry which has largely become an examination of the methods pursued by medical boards towards recruits. Among the most valuable evidence given must be accounted that of Colonel Sir JOHN BLAND-SUTTON as to the work of the Special Medical Board, whose function it is to examine cases where differences of opinion have existed between medical recruiting boards on the one hand and private medical advisers of the recruit on the other. The points of view being largely if not wholly different, it is not surprising that the verdicts should not always agree. Speaking generally, Sir JOHN BLAND-SUTTON considered that the proportion of cases in which classifications had to be lowered by the Special Medical Board was too large, which certainly points to over-ruling by the military boards of the opinion of private practitioners. This is, though put in more reasonable form, the opinion which has been widely expressed by the public, for many of the indignant complaints to Members of Parliament, specimens of which have been ventilated in debates, show that the decisions of certain of the medical boards have been formed too hurriedly, although free from the peremptory callousness or widespread ignorance which some have imagined to exist. That the official desire to secure, at any rate for garrison duty abroad, many men who were obviously not of sufficiently good physique for general service has had fuller interpretation than was safe will be admitted by all, but whether this is a fair estimate of the amount of mischief done we doubt. As far as possible, precautions will be taken against the recurrence of abuses, while the constitution of the boards is now under official consideration.

An extraordinary estimate of the value of medical boards is suggested by the military attitude. Evidence has been given, and documents have been produced, which go far to suggest that in the eyes of the military authorities classification is of no particular service, for everybody has his uses of some sort or another in the Army, while classification can be readjusted, they believe with safety, to meet all emergencies. That is the curious position which seems to have been reached, and some military medical officials would readily find that the duty of a medical board is to interpret the view of the War Office that every man has a value in the Army, now that every form of civilian employment has its analogue with the colours. The broad acceptance of this view would be to reduce medical examination to an empty formula. At all events, the examination would merely give opportunity for the registering of a medical opinion whether an individual man could do better work, either of his own special sort or other sort, in a uniform and under Army regulations, or under civilian conditions which are now so much modified by military exigencies. That national service should be rendered is the view of us all, but when we find the sentiment growing up that, short of the grossest disabilities, such service can be rendered by men with real physical defects, we are bound to protest that extra risks will be constantly incurred both by the military employer and the militarily employed if this sentiment is allowed full sway. We disagree with the view that there is no difference between the strain of work done under private conditions and the same or similar work done in accordance with official routine; in private employment there is a flexibility of conditions that may be of the greatest benefit to the seriously unsound; and in keeping such persons out of military employ the medical boards should be of great service, though their more urgent duty is to see that the call to arms is fairly obeyed by the nation as a whole.

There is no doubt that the medical boards in some commands have tended to be better than those in others, and the discrepancies that have appeared in the numbers of rejections show that varying standards have been used; so that it is not surprising that considerable difference of opinion as to what generally takes place at the tribunals has been expressed before the Parliamentary Commission. It did not emerge with any great clearness from the statement of various witnesses as to how far it was the rule for the actions of the boards to be dictated by the chairman. That this usually happens has been strenuously denied both officially and by individual members of these boards, yet it seems to us probable that the chairman generally has had more voice than any member. It is difficult to see how it could have been otherwise, for a medical board being a form of committee, the chairman is certain to possess considerable influence over its members. Unfortunately it seems that on some of the medical boards the chairman has employed that influence purely in military directions, and it is for this reason that we welcome the fact that the constitution of the boards, although their work has of late much improved, is marked for considerable reform. The personnel of many of the boards will be reviewed especially with a view to a proper selection of local medical men for membership of the boards. We regard the frank nature of the evidence given before the Select Committee as of good omen, although its nature has been somewhat disquieting. The public, as well as the medical profession, have been able to get a well-balanced idea of the situation, and that is worth having. This war is being slowly won by the determination of the country to face the inevitable and innumerable hardships that must be suffered by the people. When there is comprehension, quickly or slowly confidence is restored, for events assume their right proportion, and the remedy for errors can be directed by deliberate reason.

Annotations.

"Ne quid nimis."

WAR EMERGENCY FUND OF THE ROYAL MEDICAL BENEVOLENT FUND.

THERE will be found in our advertisement columns the first list of the donations received for the War Emergency Fund of the Royal Medical Benevolent Fund. It is an imposing list and a practical proof of the ready generosity of the medical profession towards their fellows. We regard it as a promise for a creditable total when the Fund comes to be closed; but we must remind our readers that at present the sum obtained is quite inadequate for the purpose which the founders of the Fund have placed before the medical profession, and through them before the public. It is now nearly a year since an appeal was made by the office-bearers of the Royal Medical Benevolent Fund for support to a special emergency fund to assist medical men in temporary difficulty in consequence of having joined the Army Medical Service. A ready response was given to this appeal, enabling the Fund to deal with a number of urgent cases where help was needed, and to render in some of them more substantial assistance. By coöperating with other benevolent societies, such as the Officers' Families Fund and the Professional Classes War Relief Council, any possible overlapping of effort has been avoided. As time goes on the need has, unfortunately, become greater, and in a letter from the President, Treasurer, and Secretary of the Royal Medical Benevolent Fund, which appeared in THE LANCET on June 16th, an appeal was made for a much larger sum than was obtained last year. The letter called attention to the following obvious facts. Many members of our profession, in consequence of having joined the Army Medical Service, find themselves in temporary difficulties. Many medical men when called up had to leave on very short notice, without time to make adequate provision for the carrying-on of their practices during their absence. They have had severe losses in income even when supplemented by Army pay, while heavy expenses, such as rent, insurance, taxes, family maintenance, and education, could not be reduced. To meet these needs, which it is hoped will in many cases be only temporary, the War Emergency Fund was established. To be effective, said the letter from Dr. Samuel West, Colonel Charters Symonds, and Major Newton Pitt, the grants must be made on a liberal scale, and the fund from which they are to be drawn must be a large one. The sum obtained last year was about £4000. This is quite inadequate, as at least £25,000 will be required, even if a small proportion of those requiring assistance is to be helped. From the wealthier members of the medical profession, it is hoped, substantial sums will be received, but everyone will feel it a duty which he owes to his less prosperous colleagues to give the most liberal donation he can afford. The sum mentioned should be forthcoming, whether from within or without the profession. The demands made on the medical man at the present time are searching and imperious; he is recognised as being more essential than ever to the community, and it is only fair that his work should not be hampered by mental anxiety for his own financial position, or that of his family if he is killed or disabled. The appeal is not, and ought not to be, restricted to the medical profession, and this is the view which any medical man who is in touch with influential patients might well bring before them. It should be added that the War Emergency Fund is a special department of the Royal Medical Benevolent Fund. It is kept separate and distinct from the ordinary operations of the general fund and is under the management of a committee specially appointed for the purpose. Communications should be addressed to the Honorary Secretary, War Emergency Fund (Major G. Newton Pitt), 11, Chandos-street, Cavendish-square, W. 1, to whom cheques should be made payable.

FARM COLONIES FOR THE TUBERCULOUS.

THE spes phthisica, with which the tuberculous patient is often unjustly credited, springs eternal in the breast of those who make long plans for his recovery undaunted by the discouragements which dog the path of men of shorter vision. The well-ordered daily discipline first put into practice by Brehmer, of Görbersdorf; the re-discovery of the value of fresh air in season and out of season by Walther, of Nordrach; the system of graduated and progressive labour of which we owe the beginnings to Dr. M. S. Paterson, among others—all these still retain the confidence of the far-seeing tuberculosis expert who has not been misled into attaching undue importance to some particular phase of treatment which may at the time have captured the popular imagination. There are those who would scrap the whole of our present sanatorium system of tuberculosis because a weaver or a coal-miner after three or four months of such treatment frequently relapses upon returning to his previous conditions of life. Not so the prophet who is also the practical administrator. On the experience and lessons of the past he builds his superstructure of developing ideas. In an address commending the farm colony to the National Association for the Prevention of Consumption, at its recent annual meeting, as the most hopeful solution of the problems of tuberculosis administration, Lieutenant-Colonel Sims Woodhead was careful to describe his scheme as one link in a chain, many of whose other elements had been previously forged. His general conception of the farm colony is a comprehensive one, requiring essentially a large tract of land given over to various forms of profitable cultivation, including a generous plan of allotment for intensive culture. Colonel Woodhead regards the teaching of minor handicraft as an essential part of the scheme, in order to fit the recovering patient for emigration to one of the colonies in which he would then start with the means of livelihood. On the plan already adopted in Norway and Italy he places in the colony a "fever rest-house," combining rigid open-air treatment with the comfort of a hospital for the febrile interludes of the chronic consumptive, using it also for the old stagers who are thus deprived of the sense of being shut up in a home for the moribund. The Cambridge After-Care Association is fortunate in having such a model labour colony already in working, and in having wrested from the Approved Societies a concession in regard to sickness benefit to which we have more than once called attention, and which is being tried there with a view of introduction on a larger scale elsewhere if successful. A happy sequel to the address was given by Sir A. Griffith-Boscawen's assurance on behalf of the Ministry

of Pensions that abundant funds would be available for the re-education for industrial life of discharged tuberculous soldiers in such farm colonies, if the Ministry became satisfied that the farm colony was the best method of dealing with them. Lord Glenconner pressed upon the National Association the desirability of running for themselves a small model farm as an object-lesson of what such a curative institution should be.

THE RÔLE OF OPHTHALMOLOGY IN THE STATE.

AN editorial article in the July number of the *British Journal of Ophthalmology* suggests the advisability of a closer contact between ophthalmology and the wider interests of life. Those who devote their careers to it have tended to regard ophthalmology as a preserve to be jealously guarded, where trespassers will be prosecuted; they themselves seldom invade neighbouring territories. Both invader and invaded would, he thinks, be all the better for a freer intercourse. The most comprehensive problem with which the ophthalmologist has to deal is that of natural and artificial lighting in domestic, public, and industrial activities, but it has been left for illuminating engineers to invite ophthalmologists to show their interest in it. Lighting problems teem with difficulties which can be satisfactorily overcome only with the coöperation of properly equipped ophthalmologists. They can also help to solve the numerous questions relating to colour—colour matching by artificial light, the best colours for signal lamps, and so on—all of which involve a knowledge of physiological processes and colour vision. Pathological problems also await solution. Some years ago the Royal Society undertook, at the request of the Government, to investigate the cause and possibility of prevention of glass workers' cataract. These researches extended our knowledge of the physiological and pathological action of heat, light, and ultra-violet rays upon the various structures of the eye, and led directly to the synthetic preparation of glasses of various absorptive properties by Sir William Crookes. Years ago the War Office approached the Ophthalmological Society on the subject of tests of visual acuity for officers of the Army. What is the minimum visual acuity necessary for an airman, an artillery officer, an infantry officer, a private, a munition worker, and others? What guide does a standard in terms of Snellen's test types bear to the actual requirements of these men in their various duties? The article concludes that these and innumerable other such questions await an answer which can only be given by expert ophthalmologists, and then only after much travail of body and mind. It is futile to wait for the authorities to ask these questions. Reform can only come by the spontaneous effort of the ophthalmologist himself.

ANKYLOSTOMIASIS IN SOUTHERN INDIA.

LARGELY in response to representations made by the International Health Commission of the Rockfeller Institute, the Indian Research Fund Association are at present devoting a considerable amount of attention to the subject of ankylostomiasis in India, and two detailed investigations have already been made. The first of these inquiries was carried out by Lieutenant-Colonel Clayton Lane, I.M.S., among the coolies employed in the tea-gardens of the Darjeeling district, Assam, and his report was published in the *Indian Journal of Medical Research* (vol. iv., No. 3), to which we directed the attention of our readers in THE LANCET of May 19th. The second investigation was undertaken in the Nagapatam district of the Madras Presidency by Dr. K. S. Mhaskar, whose inquiry was chiefly made respecting the presence of hookworm infection among the coolies collected at the emigration depôt at Nagapatam; his report is now published in the last issued number of the *Indian Journal of Medical Research* (vol. iv., No. 4). The procedure he followed was somewhat similar to that employed by Colonel Clayton Lane. In addition to examining the coolies collected at the emigration depôt, he examined also hospital patients, school children, and other persons in the town of Nagapatam. The native portion of this town differs but little in character from an Indian village, none of the inhabitants, even those who are well-to-do, showing any inclination to improve the sanitary state of their surroundings. Dr. Mhaskar, in this connexion, observes that in this part of India many of the towns are in fact little more than collections of villages "deprived of the amenities of village life." He adds that the sanitary index of Nagapatam, so far as latrines and excrement disposal are concerned, is "zero." There is an almost universal practice among the male inhabitants of the small towns and villages in this locality to go outside to any unoccupied piece of land to defæcate; women and children use for the same purpose the backyards, or a small enclosure set apart, open to wind and rain, and accessible to fowls and pigs, which scatter the excrement over the surface of the ground where it cannot fail to be trodden upon. It is noteworthy that persons who wear shoes are found, on the whole, less infected by hookworms than those who go about barefoot. In Nagapatam town 91 per cent. of the stools examined contained ova of the ankylostome worm. There is no reason to suppose that Nagapatam is either better or worse in this respect than other towns and adjacent districts in Southern India. In 67 samples of children's stools obtained from schools in Nagapatam hookworm ova were found to be present in all but one. As regards the coolies at the emigration depôt they are collected from 13 districts and 4 native States of the Madras Presidency, and 98 per cent. of them were found to harbour ankylostome worms. The physical condition of these coolies, who were more or less a selected class, demonstrates that hookworm infection is not incompatible with apparent good health. It would seem from Dr. Mhaskar's investigations that ankylostomiasis is endemic in this part of India and that it is far more prevalent in the Madras Presidency than the published hospital and dispensary returns would appear to indicate. The prevailing variety of hookworm found in this part of India is, as in Assam, *Necator americanus*, although occasionally *Ankylostoma duodenale* is also discovered.

Surgeon-General Sir George H. Makins, K.C.M.G., C.B., surgeon to St. Thomas's Hospital, has been elected President of the Royal College of Surgeons of England.

THERE appeared in certain journals about a fortnight ago a letter from Sir Victor Horsley to Lieutenant-Colonel R. M. Carter. The letter was a strictly private one, but its contents were disclosed at the recent Government inquiry into Mesopotamian affairs. Neither the original document nor a copy of it was sent to any journal for publication, while the version which has appeared is incorrect.

THE PARIS CONFERENCE ON THE WAR CRIPPLE.

IN THE LANCET of May 19th we gave a report of the several sections of the Conférence Interalliée pour l'Étude de la Rééducation Professionnelle et des Questions qui intéressent les Invalides de la Guerre, which was held in Paris from May 8th–12th. On the penultimate day of the session the resolutions on which the sections of the Conference had agreed separately were reviewed in a combined sitting. The text of these resolutions has now been issued, and the following is a deliberately literal translation of them:—

Functional Restoration and Medical Gymnastics.

1. To instruct the surgeons to evacuate much sooner the wounded into the institutes of physiotherapy, without awaiting the "irremediable" cicatrisation of the lesions.
2. To create well-equipped surgical services in the institutes of physiotherapy, so as to permit the surgeons at the front to send the wounded there promptly.
3. To place a competent medical physiotherapeutist as consultant in the sanitary formations at the front.
4. Medical gymnastics should only be practised by a competent personnel (doctors, medical gymnasts, medical students, and so on).
5. To apply medical gymnastics as soon as possible to the wounded. To place some medical gymnasts in the large surgical hospitals at the front, where they will render more service than mere mechanotherapy.
6. To admit in the institutes of mechanotherapy as assistants or auxiliaries only competent persons acquainted with the principles and the practice of rational physical re-education.
7. Pedagogic gymnastics or collective motor re-education should be directed by teachers of gymnastics instructed and closely supervised by a medical physiotherapeutist.
8. To provide in all the countries for the creation of centres of university instruction in medical gymnastics.

Functional Restoration by Work.

9. The schools of functional restoration shall be placed under the sole direction of the Service de Santé.
10. Physical re-education (whether massage, gymnastics, mechanotherapy, manual work) should be confided solely to competent persons, and should not be confounded with occupational re-education, which applies to the invalided only, and not to the wounded before being invalided.
11. The work prescribed as adjuvant to physiotherapeutic treatment should be obligatory in the institutes of physiotherapy.
12. Treatment by agricultural work, which is the most frequent treatment, owing to the large number of wounded agriculturists and like workers, cannot be organised according to the same formula in diverse regions; the greatest attention should be paid in this organisation to the local modes of cultivation. The mode of cultivation regulates, in effect, the quality and the number of workers utilisable in a given area. Any organisation which does not take into account these regional considerations is doomed to most regrettable non-success, alike from the point of view of the cure of the wounded and of the work furnished to the nation.
13. Occupational work can be considered as an adjuvant of physiotherapeutic treatment, but on the express condition that it be in each case chosen by the doctor and that its execution be supervised as closely as possible by him.
14. That the invalided man submitted to a medical treatment in a hospital be admitted into a workshop of occupational re-education only on condition of being able to dispose of a sufficient number of hours to learn or relearn an occupation with utility. He should, it must be understood, present himself furnished with the medical authorisation.

Prosthesis and Mechanical Adjuvants of the Re-education.

15. It is advisable to encourage the scientific study of the prosthesis of limbs.
16. It is advisable systematically to forbid the employment of crutches in the treatment of amputations of the inferior limb.
17. Functional apparatus of prosthesis, osteo-articular and musculo-nervous, should be delivered only after minute examination, clinical, electric, and ergographic, made by competent doctors. For this there are several reasons: first, some cripples are insistent in asking for apparatus of which they have no need in order to take up again their work. Orthopædists have a tendency to give prostheses which often go counter to the end in view. In short, apparatus badly constructed, far from aiding the wounded, are injurious and hinder occupational re-education.
18. The prostheses of work, in regard to the arm or forearm after amputation, should satisfy these prime conditions: they should be simple, strong though light, easy to repair. Also well applied, making so to say one with the stump. They should be for the amputated, in the course of work, not an object of trouble or fatigue, but a precious auxiliary.
19. All our efforts should tend to perfect the mechanical helps to re-apprenticeship, of which some do not yet respond to the end sought. New advances will certainly soon see the light of day and we shall put all the wounded, to whom we have restored the inclination to work, in a position to earn a wage assuring a sufficiency for them and their family. So shall we contribute to the economic renewal of life.
20. We think that there will be occasion to adapt almost for each occupation a special working hand provided with the necessary tools. In a word, it will be advisable to individualise the hands of work.
21. On account of the interest existing in the perfecting of the apparatus of mechanical orthopædics and of the aids in re-apprenticeship, and in order to permit the grouping and utilisation of the projects of study, it is desirable that an organisation of researches be instituted in each allied country. In order to bring together the necessary experts it would be desirable for it to consist of medical specialists, engineers, technicians, and mutilated fitted with apparatus.
22. An Interallied Commission should without delay be constituted to examine all that relates to prosthesis. In this commission all the experts—i.e., surgeons, orthopædic surgeons, technicians, and, in a consultative capacity, manufacturers—should find a place.

Pensions and Gratuities.

23. That the laws on military pensions be revised, taking into account not only the physical incapacity of the invalided man but the number of children, the family charges, and the parents.
24. That particular cases should be made the object of special study, so that the injury caused may be repaired with proper regard for the previous situation and the possible situation depending on the invalidity.

Occupational Guidance.

25. That civil technical advisers be appointed at once, with the mission of giving to invalided soldiers, during their medical treatment and before their occupational re-education or their discharge, advice on their future—i.e., on the advantages presented, according to the particular case, in persevering in former work or choosing a new kind of work, and, if so, what kind. The intimate collaboration of the doctors and the occupational guides is indispensable in realising a complete re-education. It is also indispensable for guiding the maimed man and for directing him from the beginning of his re-education. But this guidance should never be forced, the good will of the subject being an essential factor for success. The re-education should follow without interruption the medical treatment, and even overlap it.
26. In view of his vocational guidance, the man will receive the advice of experts—medical, pedagogic, technical, and social. The wounded will be fully interrogated on their knowledge, previous occupation, tastes and aptitudes, their family responsibilities, eventual projects for the future, and their economic position. The man, after having visited various workshops to fix his ideas, will choose himself his new vocation. He will, in case of need, be guided by his advisers, notably by the medical man, who will judge if the exercise of the chosen work is compatible with the physical state of the subject.
27. The advisers will endeavour to interest each man in his new occupation by showing him in a concrete manner the possibility of establishing himself in a certain place and the hopes of success. The man, having definitely decided, will be admitted into the chosen workshop. If after a short period of trial he shows the desired aptitude he will be maintained there. Without that he will again appear before his advisers.
28. The advisers will be inspired, as far as possible, by the following principles. It is necessary, unless contrary to the interest of the cripple, to re-educate him in his former work or in a connected occupation. As far as possible the man should be returned to his previous work, notably as to agriculture, and if possible in a superior technical position. But only those cripples should be directed towards non-manual occupations who are educated and have shown sufficient intellectual aptitude in a preliminary examination. It is necessary to make an artisan rather than a factory worker, not to direct men towards encumbered occupations, but towards the vocations where workers are rarest.
29. It is proper to keep, as far as possible, war invalids in their previous occupational environment.
30. It is proper to keep the invalided men, in each case where possible, in the region where they resided before the war.
31. The crippled should be guided in choice of occupation by the extent of openings and the facility of obtaining situations.
32. That for the inmates of hospitals and absolute invalids there be left certain minor kinds of work which can be occupation, but will never be trades.
33. That the trades destined for the new apprentices be chosen from those which can be exercised profitably in less than a year.
34. That, speaking generally, before seeking for the invalided a new occupation, the most serious efforts be made to furnish the man with all the information calculated to re-adapt him for his former work.

Occupational Re-education.

35. The Conference is of opinion that only obligatory re-education can entirely solve the problem. But considering that this obligation encounters in certain countries resistances difficult to overcome immediately, it expresses the wish that public authorities will promote occupational re-education and the retaking up of work by all appropriate means.
36. All the wounded and unfit, victims of the war, unable to be re-educated during the hostilities, have a right to occupational re-education.
37. In absence of obligation competent persons shall be delegated by the State to lead those concerned to make use of this right.
38. During the period of re-education, besides the pension and maintenance allowance, the premiums of apprenticeship will be paid and the remuneration will be continued to those entitled thereto.
39. The State will grant subventions to private institutions which submit to its control and which are organised to assure perfect re-education, and will maintain or create as many schools of re-education as will be necessary.
40. The wounded and maimed who have accepted re-education and who have endeavoured to re-adapt and perfect themselves voluntarily, making a praiseworthy supplementary effort and augmenting their social value, have the right, as officially declared on many occasions by the public authorities, to the whole of their gratuity or pension. It will be desirable, also, to ask the State, so as to encourage re-education, to assist the re-educated wounded and maimed by various advantages, such as money prizes, loans, facilities for starting business, &c., in recognition of their good will and of their desire to take again, in spite of their disability, an active place in society.
41. On account of the constancy of the psychic factor in all the questions inherent in the occupational re-education of the invalids of war, it is necessary in the re-education to unite psychotherapy with physiotherapy, and to recognise the psychotherapeutic importance of occupational work.
42. Occupational re-education should be conceived in a broad, scientific, and humane spirit. It cannot be entrusted to incompetent persons. It comprises general instruction and education, as well as technology. It aims at improving the physical and moral state of the invalid.
43. The re-education of the wounded comprises two periods: (1) The period of functional restoration by work with the object of curing the

wounded, preparing their instruction, and inducing them to work. (2) The period of occupational re-education which begins when the lesions are consolidated, and aims at the moral, intellectual, and manual training of the mutilated. The intellectual training comprises general education and occupational technical instruction, of which the programme can be summarised in the following points: tools, raw materials, processes of manufacture, cost price and sale of manufactured articles, scheme of application. For the manual training it is necessary to banish from the instruction all empirical methods and not to linger over the elementary practices of workshops, but to initiate the apprentices in modern and rapid procedures.

44. In the regions where a local industry exists schools of apprenticeship should be erected destined for the invalids of the district.

45. The schools of occupational re-education should be placed under the chief direction of a committee composed of doctors, representatives of syndicates of workers and employers, technical workers, sociologists, members of various educative bodies, mutilated men who have been re-educated.

46. Each director of a school should make it a point of honour to keep the students with him only so long as is strictly needed for their apprenticeship, and should try, as soon as this is sufficient, to return his pupils to normal life by finding them places in their new work.

47. It is desirable that periodical reunions should permit, in each region, a regular exchange of views between the chief doctor of the centre of appliances and of re-education of the region and the directors of the schools of re-education, public and private, so as to be able to co-ordinate their efforts with the view of directing from the outset the mutilated man in the occupation best adapted to his lesion and to his former work.

48. That the competent regional organisations collect, for the use of the invalids already discharged, information indicating the workers wanted in each region.

49. That the results of the statistical inquiries of the Ministries of Labour, relating to the workers required, be rapidly communicated to the direction of the various schools of occupational re-education.

50. (*a*) That the heads of industry, of trades, of employment, collaborating with, in case of need, competent persons such as doctors, psychologists, technicians, and so on, be invited to define, with all desirable precision, the aptitudes particularly required in the various orders of work in their enterprises (specialisation, synergies, strength, address, frequency and rapidity of movements, sensorial aptitudes, intellectual faculties, &c.) That they be invited also to describe the nature of the preponderant fatigue or of the associated fatigues (muscular, nervous, sensorial, intellectual) caused by the various forms of work of their employees. (*b*) That the documents thus collected be centralised and classified, with the view of forming a series of monographs on trades, occupations, and employments, enabling individuals to turn to the careers according to their health and aptitudes. (*c*) That besides the medical card index there be established (according to the methods of physiology and psychology) a card index of the aptitudes, motor, sensorial, and intellectual, of the emotivity, habitudes and tastes, of the degree of instruction, working capacities, of the re-educable, and these cards could be communicated (without indication, at first, of the names of the subjects) to the heads of businesses for the recruitment of their personnel.

51. That the mutilated, amputated or not, if he has good will, is assured of the zealous help of the head of the workshop and of the medical specialist. This triple collaboration will contribute, in many cases, to the creation of appropriate tools or to the modification of machine tools, susceptible, in both cases, of realising the maximum of industrial output.

52. The schools of re-education, speaking generally, should be organised on a large scale, with a great number of pupils, able to choose between a variety of occupations or of kinds of instruction. One can thus distribute the pupils in a rational way, have good masters and good heads of workshops, with all the necessary equipment for instruction and for the running of the workshops. Nevertheless, it should not be overlooked that small schools have their utility in maintaining in their place of origin the invalided who do not desire to go away, and in facilitating apprenticeship in certain special industries.

53. A school of re-education should be as far as possible attached to a large hospital. There will also be centres of neurology, physiotherapy, and apparatus.

54. Commercial and administrative courses will be instituted in each college or each superior occupational school, established near a hospital centre or a centre of discharge, in order that the candidates for this kind of education do not lose the precious time elapsing between the commencement of convalescence and their discharge.

55. That the schools of apprenticeship of wounded soldiers, particularised industries established for instruction in diverse sections of occupations, be not considered by the authorities as works of public charity, but indeed as institutions of technical instruction.

56. After, as during, the war the certificates at the end of the apprenticeship will be given by industrial commissions composed of delegates of employers and of delegates of workers chosen from among the re-educated mutilated.

The Finding of Employment.

57. There is no ground for creating in the industrial establishments for the generality of cases special workshops for men invalided by war.

58. The invalided by war should receive for an equal production a salary equal to that of the sound worker. In any case the pensions allowed by law to the invalided by war cannot be a cause of diminution of the pay which is generally given in the same region, and for the same work, to the sound workers.

59. In a general way the finding of posts for the invalided by war will be confided to the organisations legally charged with the placing of sound workers, and there is no need to separate agriculture from general employment. Where the direct placing is exercised by the occupational schools as concerns their pupils or by the local committees and other bodies as concerns their protégés, these bureaux should be coördinated with the public employment offices, which should be informed regularly of the operations effected. There is advantage in the schools of occupational re-education continuing to place their pupils, but not without having, as a preliminary, consulted the departmental committee of the place of origin of the mutilated, in view of his return there.

60. The public and private employment services should apply to the invalided by war, beyond the general rules of placing of sound workers, rules which are stricter, notably as concerns the steadiness of employment, the conditions of work, and the scale of salary, as well as accessory advantages. There is need to guide the regional placing of the invalided by war by establishing a general list of the trades required by each region.

61. There is obligation for employers to give occupation, whenever it is possible, to the invalided by war.

62. That the formal contracts impose on the administrations a percentage of re-educated or re-adapted mutilated men.

63. That the regulations of the examinations in the public services be revised so as to permit the wounded in war to profit by the advantages which are offered, and that the preparation for these examinations be facilitated for them.

64. (*a*) That the organisation of coöperative societies in production and of agricultural coöperative societies be promoted. (*b*) That motive power and special machines be put at the disposition of the mutilated working at home who express a desire for them. (*c*) That a bank for loans be organised for those who on mobilisation found themselves faced with a situation to restore, whether in regard to a business, a public office, or an agricultural undertaking. (*d*) That the labour market be organised.

65. That the facilities of credit given to agriculturists be extended to the invalided artisans for purchase of tools, and that help be provided to small trading, either by capitalisation of a part of the pension or by special banks.

66. That the Allied Governments study the institution of the Crédit Mobilier (loan society on personal property) for mutilated and discharged men, with a view of permitting the invalided by war, and specially those who have been re-educated, to acquire the instruments of work and the raw material necessary to become small masters.

Agricultural Re-education and Employment.

67. Return to the land appears more and more desirable for most of the war invalids, in particular for all the wounded with nervous affections, even in certain cases for the most infirm of the nervous system.

68. That while fully respecting the liberty of the individual, endeavours should be made to lead back to the land all the agriculturists wounded and mutilated.

69. Men who may be discharged should be dealt with while they are under military control and grouped together; it is inadvisable to wait till the discharged men have returned to civil life and dispersed.

70. That the retaking up of agricultural work be logically presented to the wounded and applied as a complementary form of physical treatment.

71. That the mutilated agriculturists be returned to the land as soon as possible and do not await, inactive, in a medical centre, the settlement of the pension or the organisation.

72. That former agriculturists be directed, only in exceptional cases, towards occupational re-education and when they cannot return to the land.

73. That advantage be taken of their stay of some months in a centre of treatment in their place of origin by renewing their occupational education.

74. That a definite course of instruction, simple and practical, be organised, so as to bring within reach, in the speciality chosen, the knowledge necessary to become an agriculturist capable of developing and of perfecting his knowledge.

75. That the Ministries of Agriculture and all the agricultural authorities organise this course of instruction with the materials at their disposal.

76. That relations be established as intimate as possible between the schools of re-education and the Ministry of Agriculture so as to realise this programme with the briefest delay and in the best national interest.

77. Independently of the special schools devoted exclusively to agricultural re-education it would be desirable to see instituted, whenever possible, in the gardens surrounding the occupational schools, a practical course of instruction in intensive cultivation, arboriculture, and small holdings for the use of the artisans following their trade courses, as well as lectures at which the courses, given outside the hours of occupational instruction, would impart indispensable theoretic and scientific knowledge.

78. That there be organised, in support of agricultural re-education, an active propaganda, not only among the wounded, but especially among the institutions of re-education and placing of the mutilated, municipalities and teachers of rural communes, so that conclusive observations on the re-educated mutilated may be recorded, and, if possible, illustrated by photographs. The danger will be shown of the immediate placing of agriculturists in public or private employment and the capital interest there is, as much from the social as the individual point of view, in leaving agriculturists on the land and in perfecting their agricultural education.

79. That in order to maintain the peasant on the land and to cause the mutilated to return there, the owners be invited to interest themselves more in their properties, and after advice from competent persons to introduce on their farms the improvements indispensable to ensure a good and remunerative cultivation.

80. That the workers occupied in agriculture benefit on the same grounds as the workers employed in industries by the advantages accorded by legislation relative to industrial accidents.

81. That as rapidly as possible measures be taken to permit the mutilated to acquire land. And that notably the right be given to a military pensioner to apply a part of his pension to form a capital sum devoted, under the supervision of a competent authority, to the acquisition of land and agricultural equipment.

82. That the Ministries of Agriculture organise rural centres of instruction in local small industries, and also create associations which will assure to the workers the normal wages accepted by the Ministries of Labour.

83. That the public services be reserved only for the mutilated incapable of taking up again usefully agricultural work: amputated or paralysed in two members, upper or lower, blind, &c.

Permanent Protection.

84. That societies, assisted and instructed by the central organisations of propaganda and documentation, coöperate with the State, the Societies of Mutual Aid, and the occupational groupings for the permanent protection of the invalided by war, on all occasions where this protection should be exercised, from the day of receipt of wound.

85. That the Allied nations, as soon as possible, enter into conventions tending to fix the régime applying to war invalids, so that the latter can find protection and assistance, on the same ground as the indigenous, in any foreign country where they exercise, even temporarily, their callings.

86. To assure complete and permanent assistance for the absolute invalids.

The Care of the Blinded.

87. (*a*) *Pre-re-education.*—The creation of small workshops near the ophthalmological centres and the ophthalmological services of the hospitals should be rendered obligatory. It will not be enough in these small workshops to commence, as soon as the state of the wounded man permits, the occupational re-education; the principal task is that of facilitating for the blinded man the passage from his previous life to his new condition. We must shield him from all maladroit and depressing pity. We must take care that the revelation of his blindness be made with all the precautions that are required by his sensibility and physical state. We must seek to maintain and develop his relations with his family, either in facilitating their visits or in giving the blinded man the greatest facilities to be with his relatives as much, be it understood, as his state and the needs of medical treatment will permit. A beginning will be made by teaching him Braille. He must be given the means of entering into relation with the world as much by the processes of writing in black as by the method of typhlography Cantonnet which deserves to be adopted. If he has become another man he is not necessarily a worse man, and he must understand that he will be able to assure himself, by his work, a new existence in which he will find the means of re-making a new life, worthy, active, and happy. We must take care that he does not allow himself to be drawn into a marriage towards which his fiancée would be urged only by pity or interest. In short, we must have constantly in mind that the duty of the educator is to concern himself much less with procuring an immediate satisfaction than with assuring the future of the injured man.

88. (*b*) *Re-education.*—The blinded, as soon as their state permits, will be directed to the school of re-education nearest their home, and will not, under any pretext, be retained at the ophthalmological centre or service beyond the limits strictly indispensable for the treatment of their wounds. The directors of the schools will apply themselves to following the precepts enunciated above. At the school one will seek for each blinded man instruction in the kinds of work which seem best adapted to his condition, knowledge, and aptitudes. A difference will be made between the town dweller, whose apprenticeship should be pushed to the possible limits of perfection, and the countryman who, living more cheaply and being able to occupy himself with small works of cultivation still open to him, will only have need of adding to his pension the money coming from supplementary work, such as, for example, brush-making, chair-making, basket work, shoe-making, for which he will find clients in his immediate vicinity. The Conference voted the resolution that the "typhlophiles" devote their efforts to searching for lucrative occupations able to be exercised by the blind with a superior education: clerks, students, officiers de carrière, &c. Before the departure of each pupil the school directors will instruct families as to the moral and material aid necessary for the blinded.

89. (*c*) *Return home.*—The Conference adopts the resolution that the improvement promised in the actual pension of the blinded in war by raising the scales fixed by the law of 1831 should be realised with the briefest delay; that account should be taken of multiple infirmities and family charges, present and to come; that this increase be not paid by the State under the denomination of relief; and that all the wounded, without distinction of grade, should be entitled to benefit in the proportions indicated by the scale of pensions. On leaving the school each blinded man—peasant, workman, clerk, student, and so on—will receive the tools and instruments necessary for the occupation he is capable of exercising. These tools will be adapted to all the men's needs, notably the one-armed blind will be given the special knife of M. Lotz. The Conference resolves that the purchase of raw materials and the sale of manufactured products be facilitated to the blinded who have returned home, and in such a way as to avoid all stoppage of work: by the State in giving facilities of transport, in reserving orders for them; by private societies in assuring them in a permanent way the best conditions of purchase of raw material. It is desirable that local protection should be assured in each case by families living in the neighbourhood of the blinded man; such protectors will afford the blinded man moral aid and practical counsel, and will also on certain occasions serve as intermediaries between him and the administrations of the State or private societies.

The Deaf.

90. Lip-reading will be the only mode of re-education useful in deafness, organic, bilateral, and total. The instruction should be given by the teachers of institutions for deaf-mutes, and not by improvised teachers.

91. From the social point of view the auditory re-education with the object of allowing the deaf to utilise their remaining powers of hearing can be employed with this end concurrently with lip-reading.

92. It would be useful to create a "Fraternal Union of the Deaf by War," destined to group them, and to render easier the diverse conditions of their lives.

Sufferers from Lesions of the Nervous Centres.

93. The men gravely disabled owing to lesions of the nervous centres, still having need of attention and medical supervision, cannot be left to themselves or be returned to their families, who are unable to give the careful attention, prolonged and very costly, which is needed. The men should be re-united in special establishments, for their place is no longer either in the surgical wards or the institutions of neurological practice. It is of moment that installations reserved for these men answer not only to all the modern rules of hospital centres, but beyond this be organised with taste and even with daintiness, so that they may feel at ease. It is unnecessary that these men—to whom we owe more because they have suffered more, and are still destined to suffer morally and physically—should for a moment have the impression that they are grouped together in any kind of institution whatever on the ground of being incurable or because they are troublesome elsewhere. These men will be sent to their region of origin, and for this purpose a special service will be created in the chief town of each region or quite near this town, so as to permit frequent visits of their relatives and friends. When these establishments are founded in a town it will be well to find a place in the adjacent country to which the patients can be taken during a part of the fine season. This is what exists for those with lesions of the nervous system grouped at the Hôtel des Invalides at Paris. A single institution in the country in proximity to a great centre would obviously replace with economy the double installation. These men need special care, a particular medical supervision, a specialised medical personnel and nursing staff. The whole future of these patients depends on the attention they receive. In certain cases astonishing improvements can be hoped for with constant care and a functional re-education well conceived. Among these cases are many able to benefit by occupational re-education, either in town or rural pursuits.

94. That assistance be given to the invalided men of much diminished capacity (as those trephined), either in organising special workshops or in finding them employment, thus safeguarding their self-respect.

95. Basing itself on the experience acquired during nearly two years at the school of Ondes and on the results obtained there, the Conference wishes to see the official development of organisations analogous to those of Ondes.

Sufferers from Lesions of the Peripheral Nervous System.

96. In order to reduce the number of invalids owing to lesions of the peripheral nerves, it is desirable that the wounded be submitted, on their admission to a hospital at the front, to examination and treatment by a neurologist. The latter ought to be able to decide as to the opportunity of surgical intervention, to direct this, and all the subsequent treatment, physiotherapeutic, functional and occupational re-education. It is desirable, therefore, that neurologists be attached to the formations at the front. It is indispensable that forms of detailed observations be made out for all cases of wounds of the peripheral nerves.

Sufferers from Definite Mental Troubles.

97. War invalids presenting persistent mental defect should, more than all the other cases—on account, on the one hand, of the difficulty they have in acquiring new notions in regard to work and, on the other hand, owing to the force of the automatism and the experience acquired—be, when they are re-educable, maintained in their former work and replaced, if possible, in their previous surroundings. If this last condition cannot be fulfilled the re-education should be studied and tried in special institutions.

Documentation and Propaganda.

98. That since the question of the disabled by war, their pensions, as well as their occupational re-education, employment, and social protection, is common to all the countries of the Entente; and since it is to the interest of each of these countries to seek solutions which harmonise with the results of experience; and since these results can only be obtained by the organisation of an inter-Allied bureau of documentation on the matter, it is resolved: That in awaiting the creation of such a service by way of accord between the Governments interested, the Direction of the Statistique Générale of France be immediately charged with the collection of documents, with the object of publication, and be instructed to communicate to the Allied States such details on each question as may be asked.

99. That the Franco-Belgian Committee of the Inter-Allied Conference consider, with the least delay, the publication of an inter-Allied periodical review of prosthesis, orthopædy, and all the questions relating to functional and occupational re-education.

100. That an active and coördinated propaganda be organised in each Allied country by pamphlets, lectures, lantern demonstrations, meetings, &c., to make known in all parts of the country the resolutions adopted by the Inter-Allied Conference; to make the war invalids understand the reasons which have determined these resolutions, and the advantages which arise from them for the men and the country; to combat any contrary tendencies and propaganda, open or covert.

101. That, in order to facilitate occupational re-education: (1) The public authorities undertake to bear the cost of this re-education as well as the cost of maintaining the invalided man and his family during the course of re-education. (2) A special propaganda be carried out among the medical men and nurses of hospitals, as well as in the institutions carrying out re-education, with a view of defining the nature of their action in regard to occupational guidance, and of attaining coördination of the programmes in conformity with the resolutions of the Conference, and taking account of the usual openings in each region.

102. That a permanent inter-Allied committee be instituted to maintain the relations created by the Conference between the bodies and the persons who have taken part in its work and to prepare for the subsequent meetings of the Conference.

THE LANCET, VOL. I., 1917: THE INDEX.

OWING to the continued shortage in the paper-supply, the Index and Title-page to the volume of THE LANCET which was completed with the issue of June 30th, 1917, have been printed separately, and copies have been supplied gratis to those subscribers who have, up to July 18th, intimated to us their wish to receive them. Other subscribers will be similarly supplied, so long as the stock remains unexhausted, on application to the Manager, THE LANCET Office, 423, Strand, London, W.C. Such applications should be sent in at once.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Advanced Surgical Posts.

FROM the beginning of the war learned societies and Parliamentary Commissions have frequently discussed the best site to select for surgical stations, which should be equipped for urgent operations and as near as possible to the point at which the wounded men are picked up. The advanced aid-post, placed in the front trenches and continually exposed to heavy bombardment, can only be suitable for the first dressing, and wounded men must be evacuated from it as soon as possible to make room for newcomers. The morale of a wounded man cannot fail to suffer from the sense of being still in the midst of the battle although lying helpless on a stretcher. Grave operations, demanding an experienced surgeon, anæsthetist, assistants, and complete equipment, are only practicable in a quieter spot less crowded and less liable to sudden movement due to the fluctuations of the battle. Here are to be found the advanced surgical posts represented by mobile surgical ambulances and by immobile field hospitals set up in deep and spacious dugouts. Inasmuch as enemy bombardment is often carried out from very long distances, and as sanitary formations are always in danger from aeroplanes, it is the covered site which is generally to be preferred so long as the fighting line remains roughly stationary. Experience is now, however, beginning to show that even this solution of the problem is not completely satisfactory. Dr. Hardouin, who communicates his impressions to the Society of Surgery, cites the case of two well-managed surgical posts installed in deep dugouts 1500 metres from the front lines. At one 600 wounded men were received, of whom 23 were retained for treatment. Of the latter 7 succumbed rapidly before operation; 12 cases of hæmorrhage had ligatures applied, and were evacuated the same evening or the next day; 4 patients with abdominal wounds were retained for laparotomy. Of the last all four died, the first three at the post itself, the fourth—evacuated on the third day because bombardment rendered the air unfit to breathe—arrived at the neighbouring ambulance in a serious condition and died next day. The second post gave very similar results. The number of patients retained was greater, but on two occasions the wounded men had to be evacuated hurriedly by order of the military authority, and several died on the following day. Dr. Hardouin draws the conclusion that it is only possible to do really useful surgical work in grave cases in a field hospital situated not less than 5 kilometres from the front line, communicating with the advanced aid-posts by good roads and a well-managed service of transport. The rôle of the advanced aid-posts should be limited to collecting wounded men suffering from severe shock, particularly cases of hæmorrhage.

Prophylaxis against Measles and Scarlet Fever among the Troops.

The great frequency of measles and scarlet fever among the troops and the ease with which they develop into formidable epidemics in the conditions under which soldiers live have inclined several sanitary officers to adopt in the ambulances what is tantamount to Milne's method (painting the throat with 10 per cent. carbolised oil and rubbing the body with eucalyptus oil) in the prophylaxis of these conditions. In January, 1916, M. Lemoine (Médecin-Inspecteur) and M. Devlin (Aide-Major) employed it in certain large industrial districts which were much overcrowded with sick under conditions in which isolation of contagious cases was practically impossible. An ingenious contrivance was adopted. Each patient was enclosed in a muslin sheath hung from a wooden block fastened to the ceiling, the sheath around the head and chest being tucked under the bolster and mattress of the bed to form a kind of simple mosquito-net. The results were excellent and no epidemic occurred. Aide-Major Edgar Leroy adopted later another arrangement. Boxes made in the shape of huge coffins, the sides of which were of gauze stretched on wooden frames, were placed on the beds so as to cover the patient completely. A shutter at the level of the patient's head permitted of the two-hourly painting of the throat prescribed by Milne, and also for feeding. No case of measles or of scarlet fever was transmitted from bed to bed in the wards where these conditions were nursed side by side with the wounded. The only victim of infection was a nurse who dealt almost single-handed with a very large number of cases of scarlet fever. The patients made no complaint of the method and were sheltered from the draughts in the ambulances.

Determination by Staining of the Necrosed Parts of a Wound.

Professor Delbet recently described to the Society of Surgery a method by which the immediate closing of a wound may be safely effected after excision of the necrosed and infected parts. This method, which is now in frequent use by French surgeons, is only safe if all necrosed tissue has been entirely removed. To make this readily possible a colouring agent is employed which permeates the tissues and stains the necrosed parts. M. le Grand has worked out a dye consisting of 40 per cent. formalin to which 10 per cent. of methylene blue is added. By this solution healthy tissues are simply dyed blue, but necrosed parts become so dark as to be almost black, the parts to be excised being thus easily distinguished. The method is particularly valuable in ramified wounds, especially when complicated by fractures with splinters. Employing this method M. le Grand has only had four deaths in 109 cases of immediate suture of wounds thus treated. In 25 out of 26 cases of fracture treated in the same way the wound healed without suppuration.

July 14th.

URBAN VITAL STATISTICS.

(Week ended July 14th, 1917.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 17,000,000 persons, the annual rate of mortality was 11·7, against rates steadily declining from 12·8 to 11·2 per 1000 in the four preceding weeks. In London, with a population exceeding 4,000,000 persons, the death-rate was 12·1, or 1·7 per 1000 above that recorded in the previous week; among the remaining towns the death-rates ranged from 2·3 in Edmonton, 4·7 in Wimbledon, and 5·8 in Swansea, to 18·6 in St. Helens, 19·4 in Norwich, and 21·5 in Bury. The principal epidemic diseases caused 261 deaths, which corresponded to an annual rate of 0·8 per 1000, and included 116 from measles, 61 from infantile diarrhœa, 37 from diphtheria, 36 from whooping-cough, 6 from enteric fever, and 5 from scarlet fever. The deaths from measles were 2 in excess of the number registered in the previous week, and caused the highest annual death-rates of 2·0 in York, 2·3 in Walsall, and 5·5 in West Bromwich. The 634 cases of scarlet fever and 1067 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were respectively 8 below and 6 above the numbers remaining at the end of the previous week. Of the 3820 deaths from all causes in the 96 towns 161 resulted from violence. The causes of 34 deaths were uncertified, of which 6 were registered in Birmingham and 3 each in Liverpool and Rotherham.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual death-rate was 13·7, against rates steadily declining from 17·0 to 15·0 per 1000 in the eight preceding weeks. The 257 deaths in Glasgow corresponded to an annual rate of 12·0 per 1000, and included 20 from whooping-cough, 19 from measles, 2 from infantile diarrhœa, and 1 from diphtheria. The 91 deaths in Edinburgh were equal to a rate of 14·3 per 1000, and included 5 from whooping-cough, 2 from measles, and 1 each from diphtheria and infantile diarrhœa.

Irish Towns.—The 115 deaths in Dublin corresponded to an annual rate of 15·0, or 0·2 per 1000 less than that recorded in the previous week, and included 4 each from whooping-cough and infantile diarrhœa. The 111 deaths in Belfast were equal to a rate of 14·7 per 1000, and included 2 from whooping-cough and 1 each from measles and infantile diarrhœa.

LITERARY INTELLIGENCE.—The "Dictionary of National Biography" has been presented to the University of Oxford by the family of the late Mr. George M. Smith, and will in future be published by the Oxford University Press. Mr. Smith undertook this great work at his sole risk and expense in 1882; during 15½ years, 1885–1900, under the editorship of Sir Leslie Stephen and Sir Sidney Lee, the original promise of quarterly publication was faithfully kept; the sixty-third volume which completed the Dictionary was published in 1900, and three volumes of supplement, bringing the record down to the death of Queen Victoria, were published in 1901. In 1908–9 these sixty-six volumes were re-issued in twenty-two volumes, now the current edition. Mr. Smith died in 1901, having brought to triumphant completion without State assistance or subsidy the largest of all national collections of biographies. In 1912 Mrs. George M. Smith, to whom the Dictionary had been bequeathed, published the second supplement of three volumes, containing the lives of all notable persons who died between Jan. 22nd, 1901, and Dec. 31st, 1911. It is intended to commemorate upon the title-pages of all new issues the name of Mr. George M. Smith, the initiator and first proprietor and publisher of the Dictionary.

Correspondence.

"Audi alteram partem."

THE LUMLEIAN LECTURES AND MEDICAL RESEARCH:

THE ACTION OF DIGITALIS IN AURICULAR FIBRILLATION.

To the Editor of THE LANCET.

SIR,—When Sir John Broadbent takes umbrage at my carefully-guarded assumption that he doubts the existence of auricular fibrillation in man, he has but himself to thank. The statement in the last paragraph of his first letter is that he is "unable to accept in its entirety the doctrine of auricular fibrillation." Taken with its context, this statement could have been read in a less general sense, as I pointed out at the time. What Sir John Broadbent meant is not so important as what he conveyed to his readers, and a number of these, to my knowledge, interpreted his statement in the sense against which I directed my preliminary criticisms. I remain of opinion that they were justified in so interpreting it, and that my assumption was perfectly fair to Sir John Broadbent. My first point is gained when he dissociates himself from the wide interpretation; the issue is narrowed in that the existence of auricular fibrillation in man is not now to be questioned. It appears, also, that the conclusion that digitalis slows the ventricle in auricular fibrillation by the mere cutting off of a few impulses ("feeble," or "nervous," or otherwise, as the case may be) is not further to be questioned, and we are left with the third issue—namely, *is this action of digitalis more or less beneficial than a supposed action on the tone of the ventricular muscle?* But if it was his original desire that the discussion should be so limited, he was clearly unjustified in writing as he did. For this third issue is primarily concerned, not with the "doctrine of auricular fibrillation," but with the doctrine of *digitalis action*. Had Sir John Broadbent written "doctrine of digitalis action" he would not have been understood in a different sense, as he inevitably was in the circumstances.

I am quite prepared to accede to Sir John Broadbent's wishes and to neglect all but the third issue, for its discussion will equally well illustrate the divergence in the methods of thought of two schools. And, in parenthesis, I may remark that it is not my object in this correspondence to score a point off Sir John Broadbent, but to bring home to your readers generally the fundamental and important character of this divergence.

On the one hand, there is a body of workers who contend that in cases of auricular fibrillation digitalis exerts a remarkably beneficial action by producing heart-block, thereby showing the action of the ventricle. Upon what evidence does this contention rest? It has not been come to after a few moments of reflection, but by years of strenuous work. In published records *these workers* have shown, not only to their own satisfaction, but to that of other workers in the same field: (1) that the condition they deal with is in reality fibrillation of the auricles; (2) that an accelerated ventricular rate is reduced when digitalis is administered in cases of auricular fibrillation; (3) that any procedure which is known to induce heart-block will slow the ventricles if employed while the auricles are fibrillating; (4) that heart-block is induced by the administration of digitalis. They conclude that digitalis slows the action of the heart in auricular fibrillation by inducing heart-block, and their conclusion is arrived at by logical reasoning and is the inevitable conclusion from the facts. The same workers have shown (5) that hand in hand with the reduction of heart-rate there is a remarkable relief of symptoms. They are taught by physiology that when an accelerated heart-rate is reduced the work of the heart is greatly decreased. They further conclude, therefore, and are upon perfectly safe ground in concluding, that the symptoms are alleviated by the slowing of the ventricle which accompanies the digitalis action. On the other hand, it is held by Sir John Broadbent and those who think as he does that this explanation of the "beneficial action of digitalis in auricular fibrillation" is insufficient, and that "it is the action of digitalis in restoring the tone of the exhausted muscle so that it contracts more powerfully which plays a more important part."

It is necessary to my main object to point out that the new facts to which I have referred above have been elicited solely by members of the first school of thought; they are responsible for the observations which show that digitalis has beneficial effects in auricular fibrillation. It is not from these workers, but from a quarter from which no single new observation bearing upon this phenomenon has come, that a new and unacceptable explanation of it is offered. It is unacceptable because no argument has been put forward which has not already been considered fully by the responsible workers nor any new evidence which conflicts with their original conclusion. The attitude is, as I have said, philosophic, and it is precisely this attitude, and not Sir John Broadbent personally, that I am out to attack; and I attack it because it is sterile. What, then, are the arguments? According to Sir John Broadbent they are fully stated in his first letter. I find in his first letter these arguments:—

1. "Any clinician knows the extraordinarily satisfactory results obtained from the administration of digitalis in cases of heart failure and dropsy associated with mitral incompetence, even when the pulse is quite regular and there is no question of 'auricular fibrillation.'" To this I reply that no clinician, however much he may "know," has as yet shown this to be so. I challenge the production of the published records.

2. Professor Cushny has raised the question of a possible action of digitalis on the muscle of the ventricle. True; and he has dismissed it in the words: "This cannot be answered at present, as we have no means of measuring accurately the contraction of the human heart."

3. It is inferred that there is some mysterious and beneficial action in mitral stenosis *qua* mitral stenosis. This argument Sir John Broadbent accuses me of ignoring. I *have* ignored it; and because the idea, whatever it may be, is not so clearly expressed that I can comprehend it. The fact remains that no series of cases of mitral stenosis in which the rhythm is normal has been placed on record in which strikingly beneficial results have been demonstrated.[1]

And that ends the arguments. There is, first of all, no scientific evidence of a beneficial action in any way comparable to the strikingly beneficial action in fibrillation. There is not a shred of evidence that digitalis increases muscle *tone* in the accepted sense of that term; in fact, it is still questionable if tone, as a separate cardiac function, exists. There is, finally, no acceptable evidence that in man the force of contractions is increased by medicinal doses.

I point to the contrast, the solid and hard-earned substratum of recorded fact on the one hand, the appeal to authority (and often authority misinterpreted) and to questionable hypothesis on the other, and ask: Can I possibly consent to the view that this supposed and unproved action of digitalis upon muscle tone "plays a more important part" than does its proved action in slowing the ventricle? I answer that I prefer, as I believe your readers will prefer, a reasoned statement, each step of which is firmly cemented by original observation which has provided us with much fresh knowledge, to a hastily conceived idea, whose lead its authors have not the confidence or ambition to follow, thus to win for it, if it can be won, the support which alone can render it presentable or acceptable.

I am, Sir, yours faithfully,

Hampstead, July 7th, 1917. THOMAS LEWIS.

[1] I mean by strikingly beneficial results, such as are comparable to those obtained when the auricles are fibrillating.

THE EFFECTS OF SWALLOWING LIQUID CHLOROFORM.

To the Editor of THE LANCET.

SIR,—The inquest upon a soldier at Aldershot reported in this evening's papers (July 12th, 1917) reminds me that on March 14th, 1891, you published Practical Notes on the Administration of Ether and Chloroform, a paper read by me before the West London Medico-Chirurgical Society on Feb. 6th, 1891. In the course of it, referring to the administration of chloroform through a mouth-tube with Junker's inhaler, I said: "Take care that the bottle of the

Junker's apparatus is only one-third filled with chloroform, and that the indiarubber tubes are properly applied to the metal tubes (in the top of the bottle) each to each, or liquid chloroform instead of vapour will be administered. The danger of the accident (and its possible effect) does not require to be pointed out here by me." Care should also be taken to keep the bottle upright or similar effects will arise.

I once had an experience very similar to that recorded in the recent inquest at Aldershot. The Junker apparatus was handed to me by a theatre attendant with the tubes wrongly attached. It resulted in my driving the whole of the chloroform out of the bottle into the naso-pharynx—the tube was passed into the nostril, the operation being the removal of an epithelioma of the lower lip by the late Mr. Keetley. I had already anæsthetised the patient when I changed to the Junker apparatus and had compressed the air-ball two or three times when, the first incision of the V-shaped incision having been made, I noticed a drop of clear liquid fly out of the patient's mouth. I looked at the bottle, saw it was empty, and interrupted the operation to explain what had happened. The patient became cyanosed, the cyanosis rapidly increasing. The patient was laid on the floor and I began artificial respiration, asking for a stomach-pump and galvanic battery. Mr. Keetley at the same time proceeding to perform tracheotomy, and in doing so opened a good-sized thyroid vein from which very dark blood escaped freely. We allowed it to flow—the tracheotomy not being completed as the patient improved—and I believe that especially the bleeding and the use of the stomach-pump saved the man's life.

Altogether the time of the proceedings could not have been many seconds more than a minute. The operation was quickly completed and the patient was sent back to bed. Next morning I went to see how he was. I found him sitting upright in bed, looking happy. I said, "Have you any discomfort in your throat or pain?" and he answered, "None at all."

Now that latter fact was very interesting, in view of the well-known Bartlett case, in which it was argued that had chloroform been administered by the mouth it would have had more or less an escharotic effect. I do not intend to imply that I was a witness in that case. My impression is that it was my experience of the accident that led me to emphasise the necessity of assuring oneself that the tubes of the Junker were in order.—I am, Sir, yours faithfully,

Kensington, W., July 12th, 1917. RICKARD W. LLOYD.

THE TREATMENT OF WAR WOUNDS.

To the Editor of THE LANCET.

SIR,—In your issue of June 23rd Sir Almroth Wright again puts forward his views regarding the treatment of wounds, but does not refer to any criticisms of them. He has, however, given a few more experiments to support his ideas regarding hypertonic saline solutions; so I venture again to point out that he is really trying to demonstrate a thing which is contrary to the Newtonian law—action and reaction are equal and opposite. This being so, there must be explanations of these, as well as of his earlier experiments, which he has failed to see. Let us take, for example, the experiment with agar cylinders. In this, in view of my own experiments, it is difficult for me to believe that he made accurate quantitative estimations, and that his results were really as he assumed them to be, but granting that they were as he describes, would they not merely show that formalin rendered the agar impervious to salt while it remains pervious to water, and that osmosis therefore took place?

Then again, take the series of experiments with siphons. In these surely the true explanation is that because the salt diffused up into the siphon and made the fluid in the limb dipping into the salt heavier than that in the other, therefore a flow was established towards the salt.

Many other points call for comment and criticism, especially those relating to the antiseptic action of Dakin's solution and to "digestive cleansing," but it would hardly be worth while dealing with these so long as the criticisms regarding normal and hypertonic saline solutions remain unanswered.—I am, Sir, yours faithfully,

WM. PARRY MORGAN, M.D. Lond.,
Captain, R.A.M.C.

The Lord Derby War Hospital, Warrington, June 28th, 1917.

PURULENT BRONCHITIS.

To the Editor of THE LANCET.

SIR,—I shall be very grateful if you can spare a little of your valuable space to enable me to refer to the article "Purulent Bronchitis," by Lieutenant J. A. B. Hammond, Captain W. Rolland, and Lieutenant T. H. G. Shore in THE LANCET of July 14th.

During the past winter a large number of cases of bronchitis were admitted to the Connaught Hospital, Aldershot. Amongst such cases a very large proportion were of a distinctive type. It is unnecessary for me to dwell in detail upon the special features they presented; suffice it to mention that they were characterised by cyanosis of a particularly impressive appearance, by the expectoration of large quantities of thick purulent sputum, by increased frequency of pulse-rate and of respiration, and, most important of all, by an obstinate resistance to every form of treatment and an exceedingly high mortality. Although the majority of sufferers were among the younger men and those of comparatively poor physique, there was no definite age-incidence ascertainable, nor did it appear that this condition occurred only in those who had previously suffered from chest trouble and were presumably predisposed. Since a large majority of cases of pulmonary diseases encountered in this command run a notoriously anomalous course, we were at first inclined to believe that we were dealing with some local peculiarity, and it was only whilst special investigations were in course of procedure that we learnt that cases, apparently similar to our own, had been observed among troops both in other parts of the country and in France. Under the superintendence of Major Herbert French, consulting physician to the Aldershot Command, a paper embodying the clinical, bacteriological, and pathological results of our cases (which from the character of the expectoration we have also been accustomed to describe as "purulent bronchitis") has been in course of preparation for some months. In our investigations we have had the inestimable advantage of the services of Dr. Eyre, bacteriologist to Guy's Hospital, who has most generously afforded us all the assistance and resources of his great experience. I feel it only fair to my colleagues to state that our paper was begun long before the appearance of the article in the current issue of THE LANCET to which I allude, until the appearance of which we were not even aware that any special investigations were proceeding elsewhere. I have only to add, and it is a distinct pleasure to do so, that in every detail our results accord with those of your contributors and with every one of their six conclusions we agree without qualification. We have some additional features of interest to add chiefly on the clinical side, but these do not in any way affect the main conclusions. In fact, I hope I may be permitted to express the opinion that this admirable paper by Lieutenant Hammond, Captain Rolland, and Lieutenant Shore is a remarkably complete account of the disease and may fairly be regarded as a standard description of "a symptom-complex constituting a definite clinical entity."

I should like also to venture the hope that the publication of this paper and my own small reference to it may have the effect of focussing attention upon this special type of bronchitis which it is reasonable to anticipate will reappear during the winter months, and to stimulate the production of some form of treatment (or possibly even prophylaxis) of one of the most lamentably fatal diseases it appears possible to encounter.—I am, Sir, yours faithfully,

ADOLPHE ABRAHAMS,
Temporary Captain, R.A.M.C., Officer in Charge of Medical Division, The Connaught Hospital, Aldershot.

July 16th, 1917.

ROYAL COLLEGE FOR THE BLIND, UPPER NORWOOD.—An anonymous donation of £1000 has been sent to the Public Trustee towards the amount which is required to secure the grant of £12,500 promised by the Carnegie Trustees to the Royal College for the Blind.

TRELOAR CRIPPLES' HOSPITAL, ALTON.—At a garden fête opened at Southwood Hall, Highgate, on July 14th, Sir William Treloar said that Lady Irene Curzon had collected the greatest individual amount, £500, of any member of the Queen Alexandra League, which worked for the institution. Since the opening of the hospital 1450 children had been cured

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue :—

Killed by an Explosion in H.M.S. Vanguard.

Surgeon E. Rayner, R.N., qualified M.B., B.C. Camb. in 1912.

Fleet-Surgeon E. Cox, R.N., was educated at Cambridge University and at the London Hospital, and qualified in 1899. After holding an appointment in the out-patient department at the London Hospital, he joined the Royal Navy.

Staff-Surgeon W. G. Barras, R.N.V.R., was educated at Glasgow and at Durham Universities, and qualified in 1889. Prior to going on active service he was in practice at Govan, Glasgow, where he held several appointments, and was for some time assistant medical officer of health and bacteriologist to the burgh of Govan.

Died of Wounds.

Lieut. B. Cohen, R.A.M.C., qualified at Glasgow in 1913, and was in practice at Cape Town, South Africa, prior to joining the R.A.M.C.

Capt. W. A. Sneath, M.C., R.A.M.C., was educated at Manchester University and graduated as M.B., Ch.B. in 1910. In 1912 he took the English double qualification, and proceeded to the F.R.C.S. Eng. in the following year. After holding appointments at the Seamen's Hospital, Greenwich, at the Manchester Royal Infirmary, and in the Anatomy Department of the Victoria University, he practised at Ashton-under-Lyne. The award of the Military Cross was recorded in THE LANCET of Sept. 30th, 1916, p. 621.

Capt. H. E. Rose, R.A.M.C., attached Coldstream Guards, qualified at Glasgow in 1913, and was in practice at Acton, London, before joining the R.A.M.C.

Capt. A. G. Peter, M.C., R.A.M.C., attached Seaforth Highlanders, was educated at Aberdeen University and at King's College, London, and qualified in 1903. He had held appointments in the borough of Croydon, at the Brook and Grove Hospitals of the Metropolitan Asylums Board, and at the St. Pancras Infirmary, Highgate, and was medical officer of the Prestea Gold Mines and of the Prestea district. The award of the Military Cross was recorded in THE LANCET of Jan. 20th, 1917, p. 125.

Died.

Temp. Lieut. J. E. Foreman, R.A.M.C., was a student at the London Hospital, and qualified in 1906. He was in practice at Bournemouth before joining the R.A.M.C., and was senior resident medical officer at the Boscombe Military Hospital. He died at Alexandria, Egypt, from enteric fever, on July 9th.

Previously reported Missing, believed Drowned, now reported Drowned.

Lieut. J. G. Bradley-Smith, R.A.M.C. (see THE LANCET, June 2nd, 1917, p. 856).

Wounded.

Lieut.-Col. W. H. L. McCarthy, M.C., R.A.M.C.
Lieut. H. R. Grellet, R.A.M.C., attached Yorks and Lancs Regiment.
Lieut. J. A. McIlroy, R.A.M.C.

Wounded and Prisoner in German Hands.

Capt. H. Stokes, R.A.M.C.

CASUALTIES AMONG THE SONS OF MEDICAL MEN.

The following additional casualties among the sons of medical men are reported :—

Capt. B. N. Rice, East Yorkshire Regt., died of wounds, son of Dr. B. Rice, of Warneford Hospital, Leamington.

Second Lieut. G. L. Stokes, Royal Field Artillery, killed in action, son of Dr. L. Stokes, of Blackheath, Kent.

Second Lieut. L. N. Cook, M.C., Royal Lancaster Regt., killed in action, youngest son of the late Dr. J. N. Cook, at one time medical officer of health at Calcutta.

Fleet-Surgeon E. Cox, R.N., killed by an explosion in H.M.S. *Vanguard*, youngest son of the late Surgeon-General C. L. Cox, I.M.S.

Midshipman A. W. de Segundo, R.N., killed by an explosion in H.M.S. *Vanguard*, second son of Major C. S. de Segundo, R.A.M.C. (T.).

Lieut.-Commander A. C. H. Duke, R.N., killed by an explosion in H.M.S. *Vanguard*, eldest son of the late Colonel A. W. Duke, R.A.M.C., of Tunbridge Wells.

FOREIGN DECORATIONS.

French.

Légion d'Honneur : Croix d'Officier.—Lt. Col. W. R. Blackwell, R.A.M.C.

Légion d'Honneur : Croix de Chevalier.—Capt. (acting Lt.-Col.) R. Magill, R.A.M.C., Spec. Res.; Maj. E. T. Potts, D.S.O., R.A.M.C.; Temp. Capt. G. Rankine, M.C., R.A.M.C.; Capt. W. H. P. Hey, R.A.M.C.; Capt. F. M. Hughes, R.A.M.C.

Légion d'Honneur : Croix de Guerre.—Temp. Capt. T. Meagher, M.C., R.A.M.C.; Capt. J. A. C. Scott, M.C., R.A.M.C.; Temp. Capt. C. E. S. Wright, R.A.M.C.: Maj. W. H. K. Anderson, Canadian A.M.C.

THE TRAINING OF THE DISABLED SAILOR AND SOLDIER: A COUNTY SCHEME FOR LANCASHIRE.

We were able to state in THE LANCET of April 28th that in Lancashire the county authority was collecting information from all the education authorities with regard to the facilities they would be able to offer for training disabled men in various industries. A conference of representatives of local committees under the Naval and Military War Pensions Act, 1915, with the education authorities and other bodies in Lancashire had been convened by the lord lieutenant of the county, and held in Preston on Feb. 16th, when Mr. G. M. Barnes, M.P., the Minister of Pensions, and Sir Arthur Griffith-Boscawen, M.P., the Parliamentary Secretary to the Ministry, strongly supported the idea of coöperative action among the various interested bodies. At this conference it was resolved that it was the duty of the Government to provide the necessary cost of dealing with disabled sailors and soldiers and to repay any expenditure thrown upon local education authorities and other bodies in making provision for them. A committee appointed at this conference to go into the question has presented a report, which has reached us through Professor H. Lloyd Snape, director of education for Lancashire County Council.

The report states the unanimous conviction of the committee that a scheme for coöperative action among the local statutory committees is the only method by which each committee will be able to carry out its duties with efficiency and economy. It recommends the appointment of an advisory committee with a central bureau for the collection and distribution of information, able to focus the requirements of all the local committees, and to suggest schemes which can be carried out to meet the combined demand with a reasonable expenditure. Where such scheme related to training in technical or other educational institutions it would be sent to the education or other appropriate authority. If the scheme had reference to the extension of hospital or hostel accommodation and treatment, the advisory committee would be a useful medium for pressing the subject forward on behalf of all the local committees. The central bureau would, further, be the medium for bringing the local committee requiring any treatment or training for a man into direct communication with the institution capable at the moment of supplying it, and would keep a register of hostels and lodging-houses suitable for men who might require accommodation in any district, while receiving outdoor treatment at a hospital, or training.

An Appendix contains the report of a committee instructed to collect information on the available sources of supply for training disabled men in the county. Education committees were circularised in whose areas it seemed likely that facilities for training disabled men could be provided during the daytime, and replies to the circular were received from 56 authorities, all of whom were willing to make their resources available for training men. A detailed list has been compiled from these returns, the committee seeking to select from the information before them those areas where training for particular trades could be carried out under the best conditions. They believe that it would be preferable to provide thoroughly good opportunities of training at a limited number of centres, rather than a much larger number, in some of which, at least, training could only be of a partial character. By following such a policy, not only would training be more efficient, but expenses materially reduced. A number of education authorities were relying on the coöperation of private as well as public employers in training men. Such assistance had actually been offered in some areas, pointing to a means whereby the facilities for training could be almost indefinitely extended.

The list of facilities available includes large groups, such as (*a*) agriculture and horticulture, (*b*) engineering trades,

(*e*) building and allied trades, (*d*) coal mining, (*e*) textile occupations, (*f*) boot and shoe manufacture, (*g*) nautical occupations, (*h*) printing and allied trades, (*j*) commercial and clerical occupations, (*k*) art and art industries, and a miscellaneous group including gas-fitting, instrument-making, basket-making, boot repairing, tailoring, hair-dressing, and various other minor occupations.

A further Appendix to the Report gives detailed information with regard to the hospitals and kindred institutions and their ability to deal with disabled sailors and soldiers. The table is an extensive one, giving under the several headings: (1) name and address of institution; (2) particulars of treatment given; (3) the use of electrical and mechanical apparatus, with the qualifications of the operator; (4) availability for men resident outside the district; and (5) and (6) the number of in- and out-patients respectively who could be treated. A single example of the information offered may be given: Ashton-under-Lyne—(1) the District Infirmary, Ashton-under-Lyne; (2) all treatment usually given in a properly equipped general hospital—the hospital contains 140 beds, 22 of which are devoted to wounded soldiers, and is extending its accommodation by 28 beds, so as to take in more soldiers; (3) there is a fully equipped X ray and electrical department, under the control of a skilled medical officer, and also a department for massage, controlled by a fully qualified masseuse; (4) not at the present time, as the demands of the district (the infirmary serving Stalybridge, Hyde, Mossley, and Dunkinfield, as well as the Ashton-under-Lyne area) are more than the infirmary can fully cope with.

HOSPITALS IN INDIA.

In the House of Commons Lord H. Cavendish-Bentinck recently asked Mr. Austen Chamberlain, as Secretary for India, whether his attention had been called to the fact that there were over 140 British officers now stationed at Abbottabad, North-West Frontier Province, and that there were from 60 to 70 British officers there in peace time; whether he was aware that there was no hospital within 85 miles, and that the only hospital accommodation locally available was one room taken from the native troops' hospital. The question was a prelude to the request for an inquiry to be made into the efficiency of the Indian military medical service, and gave Mr. Chamberlain an opportunity of showing to the House that medical matters in India had been anxiously present to his mind for some time previous to the publication of the Mesopotamia Report. He said that some time ago he had formed the opinion that the standard of comfort and accommodation in the hospitals for British and Indian troops must be improved, and that progress had already been made in this respect before the Mesopotamia Report was received. Mr. Chamberlain has resigned office, and was undoubtedly placed in a position by the Report which made his action a logical one, but those who know his work during his term of authority can all testify to his anxious consideration of medical questions, if and when their *pros* and *cons* came before him. Mr. Chamberlain's description of his own position in respect of the medical breakdown in Mesopotamia was not only dignified but transparently truthful. He said:—

> I cannot say one word of excuse to palliate the horrible breakdown which occurred. I think nearly 18 months ago, 15 or 16 months at least, before I was in possession of a tithe of the information which is now available to the House and the whole country, I said that in my opinion a lamentable and, I think, inexcusable breakdown had occurred. From first to last there was no attempt made by me or by any member of the Government to pretend that things were going well when we knew they were going ill, or to hush up any maladministration which had taken place. The Commission spoke in generous terms of the letters and telegrams which I addressed to the Viceroy on this subject, but they want to know why I did not send a public despatch at the same time in the year 1915. I will tell the House what information I had in 1915. Ctesiphon was fought at the end of November and Sheikh Saad was fought on Jan. 6th. It was after these two actions that the suffering was greatest, and that great calamities and horrible miscarriages took place. I searched my papers before going to the Commission, and I cannot find that I had any information except three extracts from a letter written by Second-Lieutenant Palmer, Lord Selborne's son, which was sent to me by Lord Selborne. It was a single letter written by an officer who was killed at Ctesiphon, which reached his family after his death. How could I have founded a despatch on material such as that? What put me first on the alert was the statement by Lieutenant Palmer that he thought the sanitary arrangements were bad compared with what he had seen in South Africa, and he subsequently wrote a letter in which he described a statement I had made in this House on the authority of information received from Mesopotamia, as to the condition of the supply of comforts for the hospitals at the base as "eye-wash." That is all the information I had, and I had no conception of a breakdown such as we now know had taken place. What I was anxious for was to see that all the ordinary precautions had been taken to guard against the special dangers of a tropical climate. I did not know of any shortage of equipment and of personnel, and I was anxious to take these special precautions which tropical climates might require. It was not until the middle and close of February that the information began to reach this country in streams in letters from Mesopotamia showing what awful conditions had prevailed. I do not think there was material there for a despatch. I regret that the warnings which at my instance Lord Hardinge conveyed to the Commander-in-Chief were not sooner acted upon and were not more seriously received. I wrote direct and telegraphed direct to the Viceroy because, in the first place, I wanted to go direct to the highest authority in India and not have my message intercepted in the bureaux and the reply sent by I knew not whom, without the Viceroy or the Commander-in-Chief knowing anything about it. I telegraphed directly a private telegram because I wanted both these officers to know that the Secretary for State was personally concerned. I telegraphed to Lord Hardinge because I thought that in matters of this kind the heart of the civilian is more tender than the heart of a soldier, and that he is less ready to accept those hardships as the necessary incidents of a campaign. I was right, and if action had followed Lord Hardinge's representations at any rate the evils would have been redressed much earlier than they were.

THE SERVICES.

ROYAL NAVAL MEDICAL SERVICE.

Staff-Surgeon N. B. U. Jacob and Surgeon W. E. Lloyd have been placed on the retired list.

To be temporary Surgeons: E. A. Crook, H. Banks, E. C. Dunlop, W. Duncan, A. G. Brett, J. L. Lamont, A. O. Ross, J. Aydon, W. F. Harvey, H. J. R. Surrage, W. Meade.

ARMY MEDICAL SERVICE.

TERRITORIAL FORCE.

Lieut.-Col. H. W. Thomson to be Assistant Director of Medical Services.

Lieut.-Col. H. W. Thomson vacates the appointment of Assistant Director of Medical Services.

Major (acting Lieut.-Col.) H. Richardson to be Assistant Director of Medical Services, and to retain the acting rank of Lieutenant-Colonel whilst so employed.

ROYAL ARMY MEDICAL CORPS.

Lieutenant-Colonels to be temporary Colonels whilst employed as Assistant Directors of Medical Services of a Division: H. B. Fawcus, E. P. Sewell.

Lieut.-Col. J. C. B. Statham to be temporary Colonel whilst employed as Assistant Director of Medical Services, Lines of Communication.

F. C. Dwyer to be temporary Lieutenant-Colonel.

Majors retaining the acting rank of Lieutenant-Colonel whilst in command of Casualty Clearing Stations: C. H. Turner, J. Powell, B. F. Wingate.

Temp. Major E. L. Stone, Canadian A.M.C., to command a Canadian Field Ambulance, and to be temporary Lieutenant-Colonel while so employed.

Major S. A. Smith, Canadian A.M.C., to be temporary Major.

The undermentioned are granted temporary rank whilst employed at the Whipps Cross War Hospital:—As Major: Andrew Stewart. As Captain: Daniel Broderick.

J. Patterson, Canadian A.M.C., to be temporary Captain.

Temp. Major J. G. Hunt, Canadian A.M.C., is seconded for service with Anglo-Russian Red Cross Hospital, without pay and allowances.

Temporary Lieutenants to be temporary Captains: J. Goss, A. C. Lambert, W. A. Shafto, H. L. Morrow, J. J. Walshe, K. Black, E. E. Hughes, W. Reynolds, R. L. M. Wallis, E. G. Stanley, P. R. O'R. Phillips, M. A. MacKinnon, R. Stipe, J. G. Jones, P. S. Marshall, W. J. Moir, W. H. T. Jones, V. R. Hirsch, J. N. Lyons.

J. B. Barry, late temporary Captain, is granted the honorary rank of Captain.

Officers relinquishing their commissions: Temp. Major R. G. Riches. Temp. Capts. R. T. Cooke, M. J. Gallagher, F. H. Looney, H. T. Wilkins, R. D. Brunton, J. H. Hart, H. P. D'A. Benson, W. M. S. Robinson, W. Tregenza, E. C. Pratt, A. H. Tovey, A. Adams, J. W. McCagie, J. Muirhead, P. J. Murphy, G. N. Urie, J. H. White, L. E. V. E. Clayton, C. Reidy, M. H. Paterson, G. R. C. Wilson, N. G. Meade, A. D. Clanchy, W. F. Blewitt, A. Whitby, S. H. Booth, A. E. Henton, F. J. Wheeler, H. W. Binks, M. Macnicol, A. F. Menzies, W. A. L. H. Henderson, J. Clark, A. B. Northcote, W. S. Lazarus-Barlow, I. Alluan, A. Rennie, S. Y. Walsh, L. E. Ashley-Emile, W. Bannerman, A. A. Moon. Temp. Lieuts. G. Stivala-Aspinall, J. M. W. Morison, H. H. Lawrence, H. R. Helsby, A. F. W. Millar (on account of ill-health), J. Duredon.

SPECIAL RESERVE OF OFFICERS.

To be acting Lieutenant-Colonels whilst in command of a Field Ambulance: Major Rowland P. Lewis, Capt. Cyril Helm.

H. Robinson to be temporary Major whilst employed at the Horton (County of London) War Hospital.

Capt. M. J. Graham to be acting Lieutenant-Colonel whilst in command of a Field Ambulance.

To be Lieutenants: J. C. C. Howe (from University of London Contingent, O.T.C.), A. B. MacDougall, J. Scott, J. Adams.

Lieut. (on probation) Albert E. W. Sandelson relinquishes his commission.

TERRITORIAL FORCE.

Lieut.-Col. H. W. Thomson is restored to the establishment on vacating the appointment of Assistant Director of Medical Services.

Major (acting Lieut.-Col.) H. Richardson is seconded whilst holding an appointment as Assistant Director of Medical Services.

Capt. C. A. Spooner to be Major and to remain seconded.

Capt. (temp. Lieut.-Col.) D. E. Evans reverts to the temporary rank of Major on alteration in posting.

Capt. E. H. E Stack is seconded for duty with General Hospital.

Capt. (acting Lieut.-Col.) J. Blackwood relinquishes the acting rank on ceasing to command a Field Ambulance.

Medical News.

UNIVERSITY OF OXFORD.—At examinations held recently the following candidates were successful:—

FIRST B.M. EXAMINATION.

Organic Chemistry.—R. S. Creed, Trinity; J. Harris, Jesus; H. L. Rayner, Balliol.

Human Anatomy and Physiology.—C. C. Chavasse, Hertford; H. P. Hodge, non-collegiate; and D. B. Pauws, Trinity.

SECOND B.M. EXAMINATION.

Materia Medica and Pharmacology.—T. A. Brown, B.A., Exeter; E. H. Cluver, B.A., Hertford; D. C. Dixey, B.A., Brasenose; R. Gainsborough, Magdalen; C. F. Krige, B.A., Hertford; J. E. B. Morton, B.A., Queen's; and A. E. Thomas, B.A., University.

Pathology.—H. G. Burford, B.A., Christ Church; J. C. Dixey, B.A., Brasenose; T. B. Dutton, M.A., Magdalen; J. E. B. Morton, B.A., Queen's; H. W. Toms, B.A., Jesus; B. Tordoff, B.A., St. John's; and K. F. D. Waters, B.A., Keble.

Forensic Medicine and Public Health.—J. J. Conybeare, B.A., New; G. R. Cowie, B.A., University; E. A. Crook, New; T. B. Dutton, M.A., Magdalen; W. F. Harvey, M.A., Balliol; R. M. Humphreys, St. John's; R. W. Lush, B.A., Christ Church; J. J. Savage, B.A., Brasenose; and J. P. S. Walker, B.A., Oriel.

Medicine, Surgery, and Midwifery.—J. J. Conybeare, B.A., New; G. R. Cowie, B.A., University; E. A. Crook, New; W. F. Harvey, M.A., Balliol; R. W. Lush, B.A., Christ Church; and J. P. S. Walker, B.A., Oriel.

UNIVERSITY OF CAMBRIDGE.—At examinations for medical and surgical degrees held in Lent and Easter terms the following candidates were successful:—

SECOND EXAMINATION.

Part I., Human Anatomy and Physiology (March).—N. D. Dunscombe, Downing; H. A. A. Pargeter, Sidney Sussex; R. Y. Paton, Trinity; E. R. Sarra, B.A., Sidney Sussex; W. S. R. Thomas, Queens'; W. G. Tilleke, non-collegiate; and V. A. van Geyzel, St. John's.

Part II., Pharmacology and General Pathology (April).—G. F. Abercrombie, Caius; L. H. Bartram, B.A., Trinity; H. B. Bullen, B.A., Clare; F. T. Burkitt, B.A., Christ's; W. R. Carling, Emmanuel; A. E. Clark-Kennedy, B.A., Corpus Christi; C. H. Gunasekara, B.A., Clare; S. L. Higgs, B.A., St. John's; C. McC. Jones, B.A., Downing; G. W. Karunaratna and J. R. Mitchell, B.A., Clare; E. N. Showell-Rogers, B.A., Caius; A. G. Shurlock, B.A., Jesus; S. D. Sturton, Emmanuel; C. E. Taylor, B.A., Trinity Hall; G. W. Theobald, Emmanuel; D. Wallice, B.A., Clare; and D. E. Wijewardene, B.A., Peterhouse.

Part I., Human Anatomy and Physiology (June).—B. H. Cole, B.A., H. Selwyn; H. A. Crowther, St. John's; R. H. Emmett, Trinity; D. G. Garnett, Pembroke; F. R. Oliver and C. L. Pasricha, Caius; A. D. Porter, Pembroke; A. E. Roche, Magdalen; W. Shaw, St. John's; N. G. Thomson, Emmanuel; and A. D. Whitelaw, St. John's.

THIRD EXAMINATION.

Part I., Surgery and Midwifery (June).—H. R. Bickerton, B.A., Trinity Hall; A. J. Copeland, B.A., Pembroke; E. T. D. Fletcher, B.A., Magdalen; H. Gainsborough, B.A., Downing; A. R. Jennings, M.A., Jesus; J. B. S. Lewis, B.A., Downing; A. H. Pearce, B.A., Clare; and S. Riddiough, M.A., King's.

Part II., Medicine, Pathology, and Pharmacology (June).—K. B. Dickson, B.A., Trinity; H. Gainsborough, B.A., Downing; D. W. R. Richardson, B.A., Caius; and F. A. Williamson, B.A., Queens'.

UNIVERSITY OF BRISTOL.—At examinations held recently the following candidates were successful:—

M.B., Ch.B., Final Examination.—Part I. only: Evelyn Bessie Salter.

Diploma in Public Health.—Part II., completing examination: Isaac Bernard Barclay. Part II. only: Henry James Drew Smythe.

Diploma in Dental Surgery, Final Examination.—William Holder Shipway.

B.D.S., Second Examination.—Doris Breta Milton.

Diploma in Dental Surgery, Second Examination.—Violette Bourgeois.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At the Second Professional Examination in Anatomy and Physiology, held on June 28th and 29th and July 2nd and 3rd, 91 candidates presented themselves of whom 60 were approved and 31 were rejected. The following are the names of the successful candidates:—

Fanzi Farid Abdullah, St. Mary's; Robert Geoffrey Addenbrooke, Birmingham University; John Griffith Barrie, Guy's; George Frederick Baxter, Westminster and King's College; Alexander Herbert Bean, University College; Solomon Blackman, London Hospital; Hugo Boger, University College; Hubert Brookman, Middlesex; George Frederic Burnell, King's College; Frederick Cecil Wray Capps, Cambridge University and St. Bartholomew's; Louis Ely Reginald Carroll, St. Bartholomew's; Leslie Charles Frederick Chevens, St. Thomas's; Francis Christian, Calcutta and Middlesex; Gilbert Leedham Clements, Birmingham University; Henry Nathan Warner Collins, King's College; Percival Charles Collyns and Jose Joaquim da Gama Machado, St. Bartholomew's; Kenneth Vincent Deakin, Manchester University; Francis Percival de Caux, St. Bartholomew's; Archibald Glen Duncan, London Hospital; Dwijendra Nath Dutt, Edinburgh University and Middlesex; Arthur James Fenn and James Hassall, France, King's College; Werner Göthe, Middlesex; Martin Curgenven Hartley, London Hospital; Henry Hirst, Manchester University; Thomas Barnard Hodgson, Oxford University and St. Bartholomew's; Donald Hunter, London Hospital; Frederick James, King's College; Madari Andia Keshvalu, Madras and University College; Joseph Victor Landau, St. Bartholomew's; Henri Toussaint Le Vieux, Guy's; John Andrew Mackay Ross, St. Bartholomew's; Tadros Ibrahim Makar, King's College; Prosper Henry Marsden, Liverpool University; Christopher Wesley Narbeth, St. Bartholomew's; Charles Frederick Newman and Vernon Arthur Newton, Birmingham University; Daniel Joseph O'Meara, Guy's; Frederick Ferdinand Petersen and Norman August Marsis Petersen, London Hospital; Herbert Alfred Potter, Middlesex; Shaikh Abdul Hakeem Qureshi, Bombay and University College; Edgar Lewis Jones Reason, St. Mary's; John Groscort Reed, St. Thomas's; Ronald Cunliffe Shaw, Manchester University; James Victor Alexander Simpson, Middlesex; William Arthur Merrett Smart, London Hospital; Frederic Downing Spencer, Birmingham University; Philip Steinberg, London Hospital; Edward Howard Strange, University College, Cardiff; Aubrey Clifford Teuten, St. Mary's; Mark Tree, London Hospital; Terence Watson Turner, Aberdeen; Germain Victor Leon van Acker, Oxford University; Norman Victor Wadsworth, Guy's; William Walsham, St. Mary's; Tudor Williams, University College, Cardiff; Henry Norman Witham, St. Thomas's; and Jacob Elias Zeitlin, London Hospital.

At the quarterly examination in Practical Pharmacy, held on July 5th and 6th, the following candidates were approved:—

Alexis Oswald Bekenn, Birmingham University; Charles Clement Beney, Cambridge University and London Hospital; Henry Walter Breese, Middlesex; Mary Burfield, Marion Constance Vera Clarke, and Beatrice Lakeman Collins, Royal Free; Olive Francis Conoley, London Hospital; Cyril George Coombs, Guy's; Nancy Barbara Daniell, University College Hospital; James Douglas Dimock, Sheffield University and Middlesex; Clarence Franklin Eminson, Charing Cross; Nancy Kathleen Gibbs, Cardiff; Thomas John Ernest Gittins, Birmingham University; Samuel Gordon, Cardiff; Cyril Bowdler Henry, Sheffield University and Westminster; Arthur Robert Hill, Middlesex; Cyril Patrick Hines, Charing Cross; Harry Cunliffe Hopkinson, Cambridge and Manchester Universities; Mohammed Ibrahim, Middlesex; Violet Ruth Jeffery, Royal Free; Evelyn Hope Johnson, Manchester University; George Henry Johnson, Middlesex; David Ellis Jones and Wyndham Moody Jones, Cardiff; Eric John Llewellyn Jones-Evans, St. Thomas's; Francis William Kemp, Charing Cross; George Spencer Lajus Kemp, Sheffield University; Wright Lambert, Middlesex; Kenneth Wilfred Leon, St. Bartholomew's; Elizabeth Kathleen Mackay, Charing Cross and King's College; Edgar Duncan Macmillan, St. Bartholomew's; Donald Gregory Macpherson, New Zealand University and University College Hospital; Gordon Manet-Wallett, St. Bartholomew's; David Chaim Mintzman, Marseilles, Paris, and King's College; Ivor Noble Orpwood Price, Cardiff; Mohammed Abbas Ragy, King's College; Mary Jane Ripley, University College Hospital; Walter Manley Savory, Middlesex; Harry Norman Schapiro, Guy's; James Mortimer Schofield, St Mary's; John Share-Jones, Liverpool University; Mohamed Sidky, Cairo and Guy's; Norman Leigh Simpson, Cardiff; Margaret Charlotte Sorace, Royal Free; Sobhi Rizkallah Simaika, St. Bartholomew's; George Foster Smith, Manchester University; William Henry Barton Stride, private study; Annie Dorothea Symons, Royal Free; Leslie James Timings, Birmingham University; Edward Sherman Toogood, Oxford University and University College Hospital; Jacob Eliza de Villers van der Merwo, Guy's; William John Vickers, Birmingham University; and Fuad Wanis Zaglama, Manchester University.

THE NATIONAL MEDICAL UNION.—The annual general meeting of the National Medical Union was held on June 30th at 346, Strand, London, W.C., under the presidency of Mr. V. T. Greenyer. The report of the Council having been received and adopted and the balance-sheet approved, the following, among other resolutions, were passed:—

1. That the question of establishing a Ministry of Health should be postponed till after the war, in view of the importance of the question to the profession and the number of its members abroad on military service.

2. That any provision made for medical attendance on discharged disabled soldiers and sailors ought to be outside the National Insurance Acts, and that such provision ought to be made under conditions which will allow of these persons being attended by any registered practitioner they may respectively choose.

3. That the National Medical Union protests against the State employment for wages or reward of conscientious objectors by the National Health Insurance Commission or by any other Government department.

4. That the National Medical Union, while upholding the principle of saving infant lives, strongly disapproves of the methods of the Local Government Board. The propaganda involved in the National Baby Week cannot but tend to demoralisation.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At a meeting of the College held on July 17th, the following gentlemen, having passed the requisite examinations, were admitted Fellows:—

Thomas Ewing, M.B., Ch.M. Sydney; William Lang Hodge, L.R.C.S. Edin.; John MacLean, M.B. Tor., M.C.P. & S. Sask.; William Wood Shorten, L.R.C.S. Edin.; Horace Powell Winsbury White, M.B., Ch.B. Edin.; and Frederick Joseph Woo, M.B., Ch.B. Edin.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL (UNIVERSITY OF LONDON).—The following awards have been made:—Burney Yeo Scholarships: E. H. Cluver, Hertford College, Oxford; M. S. Thomson, Downing College, Cambridge. Senior Scholarship: L. B. Goldschmidt. Tanner Prize: D. C. Clark and C. K. Scales (equal). Todd Prize and Medal: A. Blackstock. Class Prizes: Medicine—L. M Moody; Obstetric Medicine—A. Blackstock; Pathology—D. C. Clark and L. M. Moody; Hygiene—L. M. Moody Psychological Medicine—A. N. M. Davidson.

METROPOLITAN HOSPITAL SUNDAY FUND.—The following are among the amounts received at the Mansion House to date:—

	£
St. Mark's, North Audley-street	1440
St. Columba's, Pont-street ...	436
Holy Trinity, Sloane-street...	271
Essex Church, Kensington ...	256
St. Paul's, Knightsbridge ...	222
St. James's, Paddington ...	217
Greek Church, Bayswater ...	167
St. Peter's, Cranley-gardens	146
St. Paul's, Onslow square ...	133
Holy Trinity, Tulse Hill ...	127
St. Margaret, Halstead	118
St. Barnabas, Kensington ...	94
Christ Church, Chislehurst...	91
Holy Trinity, St. Marylebone	85
All Souls', Hampstead	82
All Saints', Highgate	80
Annunciation, St. Marylebone	76
St. Peter's, Bayswater	69
Holy Trinity, Sydenham ...	66
Fulham Parish Church... ...	65
Barnet Parish Church	62
St. Paul's, Wimbledon Park	56
St. Peter's, Belsize Park ...	51
St. Mary and St. Mary-le-Park, Battersea	51
Regent-square Presbyterian Church	51
St. Peter's, Dulwich Common	51
St. James's, West Hampstead	51
St. Luke's, Kilburn...	50
St. James's, Hatcham	48
St. Giles-in-the-Fields	45
St. Luke's, Battersea	45
St. Cuthbert's, West Hampstead	45
St. German's, Blackheath ...	43
All Saint's, Notting-hill ...	41
St. Margaret, Lee	41
Bromley Cong. Church... ...	40
St. Mary Magdalene, Munster-square	40
St. Dunstan's-in-the-West ...	38
Streatham Wesleyan Church	38
Union Chapel, Islington ...	38
St. James's, Holloway	34
Islington Parish Church ...	33
Christ Church, Chelsea... ...	32
Holy Trinity, Haverstock-hill	31
St. Michael's, Abbey Wood ...	30
Merton Parish Church	28
St. Mary's, Finch.ey	27
Streatham Hill Cong. Church	27
St. John's, Hoxton	27
Clapham Parish Church ...	26
St. Margaret, Streatham ...	26
St. John's, Southall	26
St. Gregory, Earlsfield	26
St. Augustine's, Grove Park	25
St. Dunstan's, East Acton ...	25
St. John's, Balham	24
St. Alban's, Streatham	23
Ferme Park Baptist Church	22
St. Barnabas, Homerton ...	22
St. Peter's, Horndon	21

Total available for distribution about £50,000.

SUMMER GRADUATION IN BELFAST.—The summer graduation at the Queen's University of Belfast took place on July 11th in the Examination Hall. There were 200 women students on the rolls last session, and their success in the Faculty of Medicine proved remarkable. This faculty has markedly increased in numbers and of 1000 officers supplied to the Navy or Army by the University the great majority are doctors.

THE NATIONAL WELFARE AND ECONOMY EXHIBITION.—This exhibition, of which Queen Alexandra is a patron, will remain open until August 11th. It is being held at the New County Council Hall, Westminster Bridge, S.E., and the profits will be devoted to the British Red Cross Society. The exhibits cover a very wide range and deal with welfare and economy, both in the home and workshop. The care of children and the preservation and selection of food are demonstrated on the one hand, and on the other the health and comfort of the worker. Under this last heading fall the exhibits arranged by the Ministry of Munitions for the purpose of showing what is being done for the improvement of health and industrial conditions among munition workers. Sleeping accommodation provided in the hostels which are being erected to house workers imported into districts where lodgings are scarce is illustrated by a small cubicle for one girl worker and a double cubicle for two friends. These are particularly interesting as showing economy of fitting under healthy conditions. A model dining-room and kitchen has been fitted up by the Carron Iron Company, and a munition workers' canteen such as is to be seen in many controlled munition establishments has been arranged by the Richmond Gas and Meter Company, Warrington. A model hospital ambulance room shows how and where minor accidents and illnesses can be dealt with among munition workers; Messrs. Reynolds and Branson and Messrs. Cuxson Gerrard and Co. exhibit in this connexion sterilised dressings and appliances modelled on the suggestions of the Home Office and of the Health of Munition Workers Committee. In the same section is a display of various garments used by workers when filling shells or dealing with corrosives. Cloak-room accommodation designed to provide privacy without wasting space is well demonstrated by the Crittall Steel Furniture Company. A small crêche represents the kind of provision made in many populous districts for the care of infants of women munition workers and is an excellent example of what such a nursery should be; and here may be mentioned the exhibit of the Glaxo Company, which practically demonstrates most of the things which a mother ought to know if she wishes to rear a healthy child. Dolls dressed as babies, mothers, nurses, and "Gamps" take a prominent part in this objective teaching. Other exhibitors are the Jeyes' Sanitary Compounds Company, 64, Cannon-street, E.C., and Messrs. Brown and Polson, 6, Bouverie-street, E.C., while food economy, children's welfare, and agricultural societies are well represented. The exhibition is not yet complete, but there is a sufficiency of exhibits, lectures, and demonstrations on domestic and national economy to make a visit to it valuable.

ROYAL COLLEGE OF SURGEONS OF ENGLAND: ELECTION OF PRESIDENT.—A meeting of the Council was held on July 13th, Sir W. Watson Cheyne, the President, in the chair. The President announced the results of the recent election to the Council, as already reported in THE LANCET, and stated that Mr. Harrison Cripps, being third on the poll, became substitute member for the late Sir Frederic Eve until July, 1920. Mr. Cripps, Mr. Warren Low, and Mr. James Sherren were introduced, and they made declarations in the terms of the oath prescribed by the Charter of 1800 and took their seats on the Council. It was resolved that diplomas of the Licence in Dental Surgery should be granted to three successful candidates. It was resolved to grant, in conjunction with the Royal College of Physicians of London, Diplomas of Public Health to five successful candidates. The thanks of the Council were given to Mr. Alban Doran for the gift of several valuable books to the library; to Sir William Osler for presenting a manuscript letter by G. J. Guthrie, President of the College in 1833, 1841, and 1854, addressed to Inspector-General William Fergusson on the subject of field surgery and wounded in the Peninsula; and to Mr. W. E. Dring, of Tenterden, for presenting to the College a crayon portrait of Robert Liston, presented by him in 1834 to Robert Swinford Francis, one of his first pupils and dressers. The following appointments were made:—Hunterian professors: Arthur Keith, six lectures on the Anatomical and Physiological Principles Underlying the Treatment of Bone and Joint Injuries; Jonathan Hutchinson, one lecture on the Surgical Treatment of Trigeminal Neuralgia; William Tindall Lister, one lecture on the Pathological Aspect of Certain War Injuries of the Eye: Percival Pasley Cole, one lecture on the Treatment of War Injuries of the Jaws and Face; Edward Kenneth Martin, two lectures on Projectile Fracture of Limb Bones; and Hildred Carlill, one lecture on Syphilis of the Nervous System. Arris and Gale lecturers: Frederick Gymer Parsons, one lecture on Research on the Structure of the English Skeleton; and William Wright, two lectures on the Quaderni d'Anatomia by Leonardo da Vinci. Erasmus Wilson lecturer: Samuel George Shattock, six demonstrations on Surgical Pathology. Arnott demonstrator: Arthur Keith, 14 demonstrations to form a continuation of the Hunterian lectures.

Surgeon-General Sir George H. Makins was elected President and Mr. Charters J. Symonds and Mr. W. F. Haslam were elected Vice Presidents. Mr. Cripps was elected a member of the Executive Committee of the Imperial Cancer Research Fund in the place of the late Sir Frederic Eve. The President was appointed a member of the Committee of Reference.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.—The annual provincial meeting of this society was held at Birmingham on June 30th, Dr. John Robertson, the President, being in the chair. Mr. T. W. N. Barlow opened a discussion upon the status of the medical officer of health in relation to the proposed Ministry of Public Health. He considered that an immediate end should be made of a system whereby seven or eight different Government departments dealt with matters affecting the health of the community, with consequent overlapping, overstaffing, and increase of expense. Unification was as necessary at the periphery as at the centre, and there should be one body locally to deal with all questions affecting public health. The predominant nucleus of that body should be the existing health committees of large urban councils, county borough councils, and county councils, for the reason that they already had large experience in such matters and they were under the control of the ratepayers who would have to supply them with funds. There would have to be a person appointed to advise this body, and to supervise, coördinate, and control all agencies having for their object the improvement of public health. That person should be the one who had already organised tuberculosis work, maternity and child welfare centres, school medical work, and the ordinary work of a public health department. He could not agree with any proposal for the appointment of dual officials, one administrative, the other clinical. The President felt that there was a lack of appreciation of what had been done directly and indirectly by medical officers of health in preventive medicine. The records of results attained in this country justified the claims of the medical officer of health to be the head of the new department. Dr. A. Bostock Hill said that the general practitioner was still in fear of the Local Government Board on the one hand and of the administrative officer on the other. The coming together of the general practitioner and the medical officer of health would be to their mutual advantage, for public health was developing on the lines of medicine rather than on those of pure science. Dr. G. F. Buchan was of opinion that the care of the individual would have to be the main conception of the Ministry of Public Health, which must have expert advisers possessed of organising ability and imagination of a sort trained to deal with health problems. Lieutenant-Colonel Herbert Jones, Mr. T. O. Halliwell, Dr. S. Barwise, and Dr. E. H. Snell also took part in the discussion.

A QUESTION OF FEES.—At Co. Fermanagh Assizes an important case was heard recently, Dr. E. C. Thompson, surgeon to the Co. Tyrone Infirmary, Omagh, sued the Lisnaskea board of guardians for £12 12*s.* in payment of three special consultation visits to the workhouse hospital. He had motored 31 miles on each occasion and he said that, owing to the increased cost of petrol and other necessaries, he could not take his former fees of £9 9*s.* After medical evidence had been tendered in support of Dr. Thompson's claim Mr. Justice Madden gave a decree for the full amount.

IN a sympathetic notice of Sir Armand Ruffer in a recent number of the *Paris Médical* Professor Jules Guiart states that the Greek Army has arranged to perpetuate the memory of a great benefactor, and Generale Comnéne, War Minister to the National Government, has directed that one ward in every Greek hospital shall in future bear the name of Ruffer.

MEDICAL MAGISTRATE.—The name of Mr. Peter Buchanan, M.B., C.M. Glasg., has been added to the Commission of the Peace for the County of Gloucestershire.

ROYAL ALBERT HOSPITAL, DEVONPORT.—A special meeting of the governors of the Royal Albert Hospital was held last week, under the presidency of Lord St. Levan, to consider the serious financial position of the institution. It was stated that the present adverse balance of the hospital was £1257, and it was estimated that by September the deficit would be £2857. After some discussion it was unanimously resolved to sell stock which would realise about £2100.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Military Service (Review of Exceptions) Act: Western Command and London.

THE Select Committee of the House of Commons which is investigating the subject of the medical examination of recruits for the Army, particularly in relation to the Military Service (Review of Exceptions) Act, has heard further evidence.

On Wednesday, July 11th, Surgeon-General HATHAWAY gave evidence in regard to the work of medical boards during the time he was D.D.M.S. on the Western Command. He had visited nearly all the boards in that area. When he heard that there was dissatisfaction with any particular board he inspected it himself, or sent some officer experienced in recruiting to examine the matter at the earliest possible moment. He had ceased to act in the Western Command about the last week in June. In the Western Command, taken as a whole, the medical boards worked harmoniously. A very large portion of the evidence was directed to individual cases arising in Manchester and Liverpool in connexion with medical examinations.

Colonel C. R. TYRRELL, A.D.M.S., London District, spoke as a witness of the composition of recruiting medical boards in London. Members of those boards, he said, felt very much that they were abused.

Mr. SUTTON (a member of the Committee) said that they were abused by civilian members of their own profession all over the country.

Mr. MOONEY (who was acting as chairman): Your opinion is that the doctors have done their work well?

Colonel TYRRELL: That is my opinion.

Mr. MOONEY: And they are working under very adverse circumstances?

Colonel TYRRELL: That is my opinion. They deserve credit and thanks rather than blame.

On Thursday, July 12th, Sir RYLAND ADKINS, K.C., M.P., gave evidence based on his experience as a member of the Northamptonshire Appeal Tribunal. His general impression was that the arrangements for medical examinations and re-examinations were not working in a way which gave the tribunals as much assistance as he thought they would be glad to receive. There had been very remarkable contrasts in the classification of men who came before his tribunal. The impression forced on his mind was not that the medical men concerned were not men of ability and devotion, but they were overworked and had to do things too quickly. Therefore the results which they arrived at were wanting in weight. There was now a feeling of uncertainty and variableness which made it very difficult to send to the Army everyone who ought to go in and keep out men who would be better out than in. He thought that the delay in sending men to the central medical boards should be obviated, and that other boards of this kind should be set up at other places than London and Leeds. At present he pointed out there was no security that once in the Army a man's classification would not be raised by an officer over whom the tribunal had no control. He suggested that there should be a medical tribunal to whom a man could appeal on having his category raised by his commanding officer and his medical officer. He would be glad if the classification could only be raised by a medical board. That would do much to re-establish public confidence in districts where it had been seriously impaired.

Mr. A. RICHARDSON, M.P., chairman of the Law Society's Appeal Tribunal, also gave evidence. He expressed the view that medical boards were at present without effective supervision.

The Mesopotamia Commission Report.

Both Houses of Parliament on Thursday, July 12th, and Friday, July 13th, discussed the report of the Mesopotamia Commission, and the main trend of the debate turned upon the nature of the inquiry which was to be instituted to investigate the actions of persons, military and civil, who were affected by the Report. The Government at first indicated that in its view a court of inquiry should be set up under the provisions of the Army (Courts of Inquiry) Act, 1916, consisting of two persons who had held high judicial office and three officers. A specially appointed statutory commission was suggested as an alternative in the course of the debate. Mr. LLOYD GEORGE intimated that if the House of Commons preferred the second alternative as the best method of getting at the truth, the Government was prepared to submit proposals carrying it into effect. There was no desire to shield anyone who was in the least to blame for the terrible catastrophe in Mesopotamia. From the Government bench certain criticisms were passed on the methods by which the Commission had arrived at its findings. Mr. CHAMBERLAIN announced his resignation of the office of Secretary of State for India. The Prime Minister said that there was nothing in the report of the Commission to justify the right honourable gentleman feeling that he ought to have resigned.

On Wednesday, July 18th, Mr. BONAR LAW said that in view of the considerations urged during the recent debates and the objections raised to further inquiry as a preliminary to executive action in case of persons implicated in the Mesopotamia report, whether the inquiry were by any existing tribunal or by a special statutory court to be set up for this purpose, H.M.'s Government had decided not to proceed further with their former suggestion. As regarded the soldiers, the Government had decided that they should be dealt with by the Army Council in the ordinary way.

Public Health (Prevention and Treatment of Disease) (Ireland) Bill.

A Bill has been introduced in the House of Commons by Mr. DUKE, Chief Secretary for Ireland, "to amend Section 148 of the Public Health (Ireland) Act, 1878, as respects the prevention and treatment of disease in Ireland." It is in the following terms:—

1.—(1) The Local Government Board for Ireland shall have power to declare that one of the authorities to execute and enforce regulations made by the Board under Section 148 of the Public Health (Ireland) Act, 1878, with a view to the treatment of persons affected with cholera or any other epidemic, endemic or infectious disease, and preventing the spread of cholera and such other diseases, shall be the council of a county, and that section shall have effect accordingly as if a county council were an authority within the meaning of that section:

Provided that, except in case of emergency, the Board shall not require the council of a county to execute and enforce any such regulations without the consent of the council.

(2) Any expenses incurred by the council of a county in the execution or enforcement of such regulations shall be raised as a county at large charge.

2. This Act may be cited as the Public Health (Prevention and Treatment of Disease) (Ireland) Act, 1917, and may be cited with the Public Health (Ireland) Acts, 1878 to 1907, as the Public Health (Ireland) Acts, 1878 to 1917.

The Bill was read a second time on Tuesday, July 17th.

HOUSE OF COMMONS.

THURSDAY, JULY 12TH.

War Bread and Invalids.

Mr. ROWNTREE asked the Parliamentary Secretary to the Ministry of Food whether his attention had been called to the deleterious effect of war bread upon the health of many aged persons and invalids; and whether in *bonâ-fide* cases of necessity certified by a doctor he would consider the possibility of permitting the use of ordinary flour.—Mr. BRIDGEMAN replied: Applications for the use of special flour in the manufacture of bread, when supported by a doctor's certificate, are considered by the Ministry of Food, and licences are granted on the recommendation of a special board appointed by the Royal Society.

Pay of Medical Officers.

Colonel GRETTON asked the Financial Secretary to the War Office whether he was aware of the disparity between the pay of medical officers belonging to the Territorial Force and officers who had recently joined the Royal Army Medical

Corps; whether he was aware that majors serving as medical officers in the Territorial Force received the same pay as a recently joined lieutenant of the Royal Army Medical Corps; would he state what were the reasons of this disparity; and was it proposed to take any steps to put experienced medical officers of the Territorial Force in the same position as officers of the Royal Army Medical Corps.—Mr. FORSTER wrote in reply: The Territorial Force officer is paid at the same rate as the regular R.A.M.C. officer of the same rank and service, except that only embodied service counts for increase of pay in the same rank. The comparison which my honourable and gallant friend wishes to make is probably that between the pay of the Territorial Force officer and of the temporary officer engaged on special contract terms during the war. When allowances and terminal gratuities are taken into account, the major of the Territorial Force receives considerably more than the special contract officer.

MONDAY, JULY 16TH.

Admiralty Payments to Surgeons.

Mr. FRENCH asked the Secretary to the Admiralty whether he was aware that the local surgeons and agents of the Admiralty were receiving only 2*s*. 6*d*. per patient for professional attendance and supplying medicine to the coast-guards and men of the Royal Navy and 1*s*. per mile one way for locomotion expenses; whether applications had been received from any of these officers requesting an increase of these rates of pay; and whether, having regard to the increased cost of living and the cost of drugs and petrol, he would see his way to recommend an advance of fees and allowances so as to ensure that surgeons and agents might, without loss to themselves, do justice to their patients and receive fair remuneration for their services.—Mr. MACNAMARA replied: The rates of remuneration are, with a few exceptions, in which higher rates are warranted by the circumstances of the case, 2*s*. 6*d*. each visit to or consultation with each patient (and not, as the question may perhaps imply, 2*s*. 6*d*. per case), with mileage allowance as stated. Only one application for increased remuneration has been received during the past year, although there are some 580 surgeons and agents. In the circumstances a case for a general increase of fees and allowances has not been established.

Referring to a further question relating to delays in the payments, Mr. MACNAMARA said: The suggestion that the surgeons' and agents' claims are always almost three months overdue before they are fully paid is not borne out by the facts. For instance, of 228 received in April and May for the period ended March 31st last, between 84 and 85 per cent. were finally paid in less than two months from date of receipt, 70 per cent. being settled in less than six weeks. Arrangements have, moreover, been in force since an early date in the war, by which payments on account amounting to two-thirds of any claim exceeding £10 or thereabouts are made immediately upon their receipt.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

POPE, HENRY BROUGHAM, B.A., M.D., B.Ch. (T.C., Dub.), has been appointed Medical Officer of Health for Clevedon (Somerset).

To be Certifying Surgeons under the Factory and Workshop Acts: MCINNES, A., L.R.C.P. Edin., L.R.C.S. Edin., L.F.P.S.G. (Raunds District of the county of Northampton); MCKINNEY, B.W., M.B., Ch.B. Belf. (Lisnaskea District of the county of Fermanagh); WALSH, F. P., L.R.C.P. Edin., L.R.C.S. Edin., L.F.P.S.G. (Rosscarberry District of the county of Cork).

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).
When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

BIRKENHEAD BOROUGH HOSPITAL.—House Surgeon. Salary £250 per annum and war bonus, board, &c.

BIRMINGHAM GENERAL DISPENSARY.—Resident Medical Officer, unmarried. Salary £300 per annum, with apartments, &c.

BRISTOL ROYAL INFIRMARY.—House Physician and House Surgeon. Salary at rate of £120 per annum, with board, &c.

BROMSGROVE, WORCESTERSHIRE ASYLUM.—Locum Tenens Medical Officer.

CAMBRIDGE, ADDENBROOKE'S HOSPITAL.—Resident House Surgeon. Salary £150 per annum, with board, &c.

DARTFORD, KENT, CITY OF LONDON MENTAL HOSPITAL.—Temporary Assistant Medical Officer. Salary £7 7*s*. per week, with board, &c.

DEVONPORT, ROYAL ALBERT HOSPITAL.—House Surgeon. Salary £200 per annum, with board, &c.

DURHAM COUNTY HOSPITAL.—House Surgeon. Salary and bonus at rate of £180 per annum, with board, &c.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—Resident Medical Officer. Salary £200 per annum, with board, &c. Also Assistant Resident Medical Officer. Salary £100 per annum, with board, &c.

IPSWICH, EAST SUFFOLK AND IPSWICH HOSPITAL.—Female Resident.

LIVERPOOL EYE AND EAR INFIRMARY, Myrtle-street.—Female House Surgeon.

NORTHAMPTONSHIRE WAR HOSPITAL.—Resident Medical Officer. Salary £1 daily, with board, &c.

NOTTINGHAM GENERAL HOSPITAL.—Female House Physician for six months. Salary at rate of £250 per annum, with board, &c.

OFFICERS' HOSPITAL, 18, Paddington-street.—Locum Tenens as M.O.

PAISLEY CORPORATION INFECTIOUS DISEASES HOSPITAL.—Female Practitioner.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone road, N.W.—District Resident Medical Officer for four months. Salary at rate of £60 per annum, with board, &c.

QUEEN MARY'S HOSPITAL FOR THE EAST END.—House Surgeon.

ROCHESTER, ST. BARTHOLOMEW'S HOSPITAL.—Junior Resident House Surgeon. Salary at rate of £150 per annum, with board, &c.

ROYAL LONDON OPHTHALMIC HOSPITAL, City-road, E.C.—Third House Surgeon. Salary at rate of £50 per annum, with board, &c.

ST. ANDREW'S HOSPITAL, Dollis Hill, London, N.W.—Resident Medical Officer for six months. Salary £323 15*s*., with board, &c.

SALOP COUNTY COUNCIL.—Temporary Tuberculosis Medical Officer. Salary at rate of £500 per annum.

SHEFFIELD ROYAL INFIRMARY.—Two House Surgeons. Salary £120 per annum, with board, &c.

STAFFORDSHIRE EDUCATION COMMITTEE.—Female Assistant School Medical Inspectors. Salaries at rate of £400 per annum.

THROAT HOSPITAL, Golden-square, W.—Two Resident House Surgeons. Salaries £100 per annum, with board, &c.

UNIVERSITY COLLEGE HOSPITAL, Gower-street, W.C.—Casualty Surgical Officer. Salary £100 per annum, with lunch.

VENTNOR, ISLE OF WIGHT, ROYAL NATIONAL HOSPITAL FOR CONSUMPTION.—Assistant Medical Officer for three months. Salary at rate of £5 per week, with board, &c.

WEST RIDING OF YORKSHIRE, MIDDLETON-IN-WHARFEDALE SANATORIUM, near Ilkley.—Assistant Resident Medical Officer. Salary £325 per annum.

WINCHESTER, HAMPSHIRE COUNTY COUNCIL.—Temporary Assistant County Medical Officer of Health. Salary £300 per annum.

WOLVERHAMPTON AND MIDLAND COUNTIES EYE INFIRMARY.—House Surgeon. Salary £150 per annum, with board, &c.

WOOLWICH UNION INFIRMARY, Plumstead, S.E.—Locum Tenens Medical Officer.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Hendon, in the county of Middlesex; and at Castleford, in the county of York.

Births, Marriages, and Deaths.

BIRTHS.

BAREFOOT.—On July 15th, at Cecil Mansions, Balham, the wife of Captain H. J. L. Barefoot, R.A.M.C.T., of a son.

DORNHORST.—On July 13th, at Manor-road, Stamford-hill, the wife of Dr. Hubert Dornhorst, of a daughter.

HARVEY.—On July 14th, at Primrose Mansions, Battersea Park, S.W., the wife of Major G. A. D. Harvey, R.A.M.C., of a daughter.

MOORE.—On July 11th, at St. Paul's-road, Clifton, the wife of Clifford A. Moore, M.S., F.R.C.S., Captain, R.A.M.C., of a son.

PEACOCK.—On July 12th, at the Pemberton Nursing Home, St. John's Park, North, the wife of H. Maurice Peacock, of Epsom—a daughter.

VALENTINE.—On July 12th, at Granada House, Southsea, the wife of Lieutenant J. A. Valentine, R.A.M.C. (Temp.)—a son.

WARNER.—On July 11th, at Courtleigh, Finchley-road, Golder's-green, the wife of Captain E. Lloyd Warner, C.A.M.C., of a daughter.

WILKINSON.—On July 15th, at Cottesmore, Sutton, Surrey, the wife of Captain John Douglas Wilkinson, R.A.M.C., of a son.

MARRIAGES.

HILL—KENNY.—At Aldershot, St. Joseph's R.C. Church, J. F. Hill, Captain, R.A.M.C., attached the Inniskilling Dragoons, B.E.F., France, to Kathleen Josephine, daughter of Mrs. Kenny, Abbey Street, Roscommon, Ireland.

DEATHS.

LEAHY.—On July 17th, at 4, Iddesleigh Mansions, Victoria-street, S.W., after a long and trying illness, Lieutenant-Colonel A. W. D. Leahy, M.D., F.R.C.S., late I.M.S.

PETER.—On July 5th, died from wounds, Captain Alastair Gordon Peter, M.C., R.A.M.C., M.A., M.B., Ch.B. (Aberd.), L.R.C.P. (Lond.), M.R.C.S. (Eng.), D.P.H. (Camb.).

RAYNER.—On July 9th, killed in an explosion on board on H.M.S. *Vanguard*, Edward Rayner, Surgeon, R.N., M.B. Cantab., F.R.C.S. Eng.

ROSE.—On July 7th, from wounds received in action, Captain Harold E. Rose, R.A.M.C.

STEWART.—On July 12th, at his residence, Hollywood, Pendleton, Manchester, Alexander Stewart, M.D., J.P., aged 62 years.

TWEEDY.—On July 12th, at Newquay, Cornwall, Reginald Carlyon Tweedy, M.D., &c., of Kenilworth, late temporary Major, R.A.M.C.

VAUX.—On July 11th, at Sunderland, Ralph Thomas Vaux, M.B., B.S.

WILSON.—On July 15th, at St. Hilda's-terrace, Whitby, William Henry Wilson, M.B., C.M., aged 47.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

HERB-GROWING AND COLLECTING.

A MEETING to further the interests of the National Herb-Growing Association was recently held at Plymouth. The secretary stated that since the formation of the society in September, 1914, 120 branches had been established and during the first year of its work the association had supplied 100 tons of herbs to the manufacturing chemists. They had also recently received an order for 100 tons of dandelion roots for India. The meeting finally passed a resolution approving of the work of the society and promising support to a scheme for the provision of a drying-shed in or in the neighbourhood of Plymouth.

The work of the amateur herb-grower will be greatly facilitated by reading a pamphlet drawn up by Mrs. M. Grieve, of the Whins Vegetable Drug Farm, Chalfont St. Peter, Bucks, entitled "Vegetables from the Hedgerows," and giving an account of the many wild plants of our fields and hedges that have been employed as vegetables and salads, as well as those which may be used as substitutes for tea and coffee. Our native fruits are also enumerated. Mrs. Grieve is no mere enumerator, but, whether as writer or pupil trainer, obviously possesses an enthusiasm for her subject which enables her to give much useful and accurate information in an attractive manner.

THE NEEDS OF WAR PENSIONERS.

IT has been brought to the notice of the Ministry of Pensions that a number of pensioners are appealing to the charitable on the ground of insufficient means. The Local War Pensions Committee, whose address is obtainable from the nearest Post Office, have ample powers for dealing with all deserving cases of this nature from public funds, and the charitable public should refer such applicants to this body.

M.D.—The adjective was applied to the non-odorous purulent discharges from injuries, abscesses, or wounds, surgical and other, which were pursuing a normal course in pre-Listerian times.

J. L. M. is referred to a note on depilatories on p. 825 of THE LANCET of May 26th.

CORRECTION.—The address of the Sterling Corporation Ltd. is 16, Wigmore-street, London, W. 1.

Medical Diary for the ensuing Week.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith road, W.

MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson Diseases of Women.

TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat Nose, and Ear. Dr. Pernet: Diseases of the Skin.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M. Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY.—Clinics:—10.30 A.M., Surgical Out-patients (Mr. B. Gillespie). 2.30 P.M., Medical Out-patients (Dr. T. R. Whipham); Gynæcological Out-patients (Dr. Banister). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

TUESDAY.—2.30 P.M., Surgical Operations (Mr. Carson). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. Howell Evans); Nose, Throat, and Ear Out-patients (Mr. C. H. Hayton). Radiography (Dr. Metcalfe). 3.30 P.M., Medical In-patients (Dr. A. J. Whiting).

WEDNESDAY.—Clinics:—2.30 P.M., Throat Operations (Mr. C. H. Hayton). Children Out-patients (Dr. T. R. Whipham). Eye Out-patients (Mr. R. P. Brooks); Skin Out-patients (Dr. H. W. Barber). 5.30 P.M., Eye Operations (Mr. R. P. Brooks).

THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. E. Giles). Clinics:—Medical Out-patients (Dr. A. J. Whiting); Surgical Out-patients (Mr. Carson); Radiography (Dr. Metcalfe). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

FRIDAY.—2.30 P.M., Surgical Operations (Mr. Howell Evans). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. B. Gillespie); Eye Out-patients (Mr. R. P. Brooks).

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, July 18th, 1917.

Date.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
July 12	...	119	73	54	57	62	Fine
,, 13	...	122	81	62	62	71	Fine
,, 14	...	123	84	67	64	71	Cloudy
,, 15	...	100	72	61	59	63	Cloudy
,, 16	0·10	119	71	57	59	65	Cloudy
,, 17	0·03	121	77	57	61	68	Cloudy
,, 18	0·37	92	69	59	62	63	Raining

Other information which we have been accustomed to give in these "Readings" is withheld for the period of the war.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET should be addressed "To the Manager."

We cannot undertake to return MSS. not used.

Offices: 423, STRAND, LONDON W.C. 2.

MANAGER'S NOTICES.

VOLUMES AND CASES.

VOLUMES for the first half of the year 1917 will be ready shortly. Bound in cloth, gilt lettered, price 21*s.*, carriage extra.

Cases for binding the half-year's numbers (inland edition) are now ready. Cloth, gilt lettered, price 2*s.* 6*d.*, by post 2*s.* 10*d.*

To be obtained on application to the Manager, accompanied by remittance.

SUBSCRIPTION RATES.

INLAND.	
One Year	£1 10 0
Six Months	0 16 0
Three Months	0 8 0
COLONIES and ABROAD.	
One Year	£1 12 6
Six Months	0 17 6
Three Months	0 8 9

Subscriptions (which may commence at any time) are payable in advance. Cheques and Post Office Orders (crossed "London County and Westminster Bank, Covent Garden Branch") should be made payable to the Manager, Mr. CHARLES GOOD, THE LANCET Offices, 423, Strand, London, W.C. 2.

TO SUBSCRIBERS.

WILL Subscribers please note that only those subscriptions which are sent direct to the Proprietors of THE LANCET at their Offices, 423, Strand, London, W.C. 2, are dealt with by them? Subscriptions paid to London or to local newsagents (with none of whom have the Proprietors any connexion whatever) do not reach THE LANCET Offices, and consequently inquiries concerning missing copies, &c., should be sent to the Agent to whom the subscription is paid, and *not* to THE LANCET Offices.

Subscribers, by sending their subscriptions direct to THE LANCET Offices, will ensure regularity in the despatch of their Journals and an earlier delivery than the majority of Agents are able to effect.

THE COLONIAL AND FOREIGN EDITION is published in time to catch the weekly Friday mails to all parts of the world.

TO COLONIAL AND FOREIGN SUBSCRIBERS.

Subscribers abroad are particularly requested to note the rates of subscriptions given above.

The Manager will be pleased to forward copies direct from the Offices to places abroad at the above rates, whatever be the weight of any of the copies so supplied.

NEWSPAPERS FOR NEUTRAL COUNTRIES.

Newspapers are not at present being sent forward to neutral European countries unless posted direct from the office of publishers or newsagents who have obtained permission from the War Office for this purpose. The Publisher of THE LANCET has obtained the required permission, and he will forward copies direct from the Office to any neutral country on receipt of instructions.

ADVERTISEMENT RATES.

Books and Publications ... ...
Official and General Announcements
Trade and Miscellaneous Advertisements and Situations Vacant ... ... } Five lines and under ... ... 4*s.* 0*d.*

Every additional line, 6*d.*

Situations Wanted: First 30 words, 2*s.* 6*d.*
Per additional 8 words, 6*d.*

Quarter Page, £1 10*s.* Half a Page, £2 15*s.*
Entire Page, £5 5*s.*
Special terms for Position Pages.

Advertisements (to ensure insertion the same week) should be delivered at the Office not later than Wednesday, accompanied by a remittance.

The following journals, magazines, &c. have been received:—Journal of State Medicine, Annals of Tropical Medicine and Parasitology, St. Paul Medical Journal, Medical Review, Journal of the Royal Naval Medical Service, Revista del Circulo Médico de Córdoba, Medical Officer, Therapeutic Gazette, Bulletin Mensuel de la Office International d'Hygiène Publique, American Journal of Public Health, Dublin Journal of Medical Science.

Communications, Letters, &c., have been received from—

A.—Annals of Medical History, New York, Publisher of; Messrs. Allen and Hanburys, Lond.; Addenbrooke's Hospital, Cambridge, Sec. of.

B.—Dr. N. Bardswell, Midhurst; Dr. C. A. Bucklin, Glasgow; Col. Sir David Bruce; Birmingham University, Librarian of; Dr. A. H. Bizarro, Whitchurch; Messrs. Beghè and Chiapetta, Milan; Messrs. A. E. Braid and Co., Lond.; Messrs. E. E. Becker and Co., Lond.; Messrs. Baillière, Tindall, and Cox, Lond.; Messrs. Butterworth and Co., Lond.; Messrs. C. Birchall, Liverpool; Messrs. W. H. Bailey and Son, Lond.; Dr. W. F. Blyth, Lond.; British Medical Association, Librarian of; Dr. Helen Barnes, Malta; Board of Education, Lond., Chief Medical Officer of; Messrs. Burroughs Wellcome and Co., Lond.; British Museum (Natural History), Lond., Sec. of; Messrs. Burnside, Lond.; Dr. J. E. Beggs, Lond.; Dr. M. G. Biggs, Lond.

C.—Dr. R. P. Cockin, Lond.; Dr. Cornish, Dorking; Messrs. J. and A. Churchill, Lond.; Messrs. T. Christy and Co., Lond.; Messrs. Carnrick and Co., Lond.; Coventry and Warwickshire Hospital, Coventry, Asst. Sec. of; Dr. G. M. Cullen, Edinburgh; Messrs. Clement and Johnson, Lond.; Mr. P. Cooper, Lond.; Messrs. G. Curling, Wyman and Co., Lond.; Dr. E. L. Colles, Lond.; Mrs. Christie, Greenock; Charing Cross Hospital, Lond., Sec. of.

D.—Mr. A. W. Desley, Leamington Spa; Mr. J. Dunlop, Lond.; Capt. J. E. Dods, R.A.M.C.; *Dental Record*, Lond., Editor of; Capt. N. A. Dore, R.A.M.C.; Capt. M. A. Don, R.A.M.C.(T.); Sir H. Bryan Donkin, Lond.; Durham County Hospital, Durham, Sec. of; Messrs. Dale, Reynolds and Co., Lond.; Messrs. W. Dawson and Sons, Lond.; Capt. L. Dimond, R.A.M.C.; Mr. D. Drew, Lond.

E.—Mr. D. L. Eadie, Edinburgh; Capt. C. M. Elliott, R.A.M.C.

F.—Mr. A. G. Faulds, Glasgow; Dr. W. M. Fletcher, Lond.; Factories, Lond., Chief Inspector of.

G.—Dr. C. G. Gibson, Launceston; Capt. R. P. Garrow, R.A.M.C.; Capt. E. A. Gates, R.A.M.C.; Capt. R. J. Goldie, R.A.M.C.; Messrs. Gray and Gray, Peterhead; Dr. S. Gots, Lond.; Major J. H. P. Graham, R.A.M.C.; A. G. G., Oxford.

H.—Dr. A. C. Houston, Lond.; Mrs. J. M. Harris, Addlestone; Dr. B. Hollander, Lond.; Miss V. Hort, Lond.; Prof. W. Hall, Bristol; Dr. B. C. Harrison, Lond.; Capt. N. F. Hallows, R.A.M.C.; Mr. F. L. Hoffman, Newark, N.J.; Messrs. J. Heywood, Manchester; Mr. R. B. Hoeber, New York; Capt. F. Hernaman-Johnson, R.A.M.C.

I.—Mr. S. T. Irwin, Belfast; Messrs. I. Isaacs and Co., Lond.; Imperial Nurses' Club, Lond., Hon. Sec. of; Institute of Heating and Ventilating Engineers.

J.—Mr. M. H. Judge, Lond.; Jeyes' Sanitary Compounds Co., Lond.; Jamaica, Registrar General of, Spanish Town.

K.—Dr. B. Kelly, Glasgow; Messrs. Keen, Robinson and Co., Lond.; Prof. A. F. S. Kent, Clifton; Messrs. R. A. Knight and Co., Lond.; Dr. C. Kempster, Lond.; Mr. P. A. Knight, Lond.

L.—Messrs. H. K. Lewis and Co., Lond.; Dr. T. Lewis, Lond.; Dr. M. C. Lawrance, Carlestown; Dr. M. Lyon-Mercado, Rochdale; Labour Co-partnership Association, Lond., Sec. of; Messrs. Lee and Martin, Birmingham; Capt. T. H. Lloyd-Williams, R.A.M.C.; Capt. A. Lindsay, R.A.M.C.

M.—Mr. J. McOscar, Buxton; Major C. H. Miller, R.A.M.C.; *Midland Counties Herald*, Birmingham, Manager of; Messrs. Mather and Crowther, Lond.; Maltine Manufacturing Co., Lond.; Mr. A. Morley, Lond.; Dr. Bertha Mules, Kenton; Mr. A. E. Morison, Sunderland; Mrs. Menary; Metropolitan Hospital Sunday Fund; Ministry of Pensions; Maruzen Co., Tokyo; Sir Berkeley Moynihan, Leeds; Dr. J. McIntosh, Lond.; Dr. A. Mechan, Glasgow; Dr. J. L. Martin, Chelmsford; Col. K. Macleod, I.M.S. (retd.).

N.—National Health Insurance Commission, Solicitor's Dept.; National Hospital for the Paralysed and Epileptic, Lond., Sec. of; Newspaper Society, Lond.; Nottingham General Hospital, Sec. of; National Association for the Prevention of Consumption, Lond.; Norwich, Medical Officer of Health of.

P.—Rev. J. G. Pearson, Lond.; Mr. J. Priestley, Stourbridge; Mr. S. G. Papadopoulos, Lond.; Dr. R. W. C. Pierce, Guildford; Messrs. Porteous and Co., Glasgow; Dr. F. W. Price, Lond.; Dr. R. F. Priestley, Huelva; Paisley Corporation, Town Clerk to; Capt. J. M. Pringle; R.A.M.C.(T.); Dr. J. J. Perkins, Lond.

R.—Dr. R. J. Rowlette, Dublin; Capt. J. F. Roberts, R.A.M.C.; Major L. B. Robertson, R.A.M.C.; Royal College of Physicians of Ireland, Dublin, Librarian of; Mr. F. W. Robotham, Lond.; Dr. A. Routh, Lond.; Red Cross, County of London Branch; Dr. C. A. Rayne, Lancaster; Lieut.-Col. G. Rankin, R.A.M.C.; Rockefeller Institute for Medical Research, New York; Royal Victoria Hospital, Newcastle-on-Tyne, Sec. of.

S.—Mr. E. H. Snell, Coventry; Messrs. Saward, Baker, and Co., Lond.; Messrs. J. Smith, Lond.; St. Mary's Hospital Medical School, Lond., Librarian of; St. Bartholomew's Hospital, Rochester, Clerk to the; Major A. S. Sutherland, R.A.M.C.; Sheffield University Library, Librarian of; Dr. A. Smirthwaite, Newcastle-upon-Tyne; Messrs. B. F. Stevens and Brown, Lond.; Messrs Singer and Co., Coventry; Messrs. G. Street and Co., Lond.; South Devon and East Cornwall Hospital, Plymouth, Sec. of; Messrs. W. H. Smith and Son, Norwich; Sheffield Royal Infirmary, Sec. of; St. Bartholomew's Hospital, Lond., Librarian to the; Capt. C. E. Sundell, R.A.M.C.; Prof. H. Ll. Snape, Preston; Dr. J. S. B. Stopford, Manchester; Prof. W. Stirling, Manchester; Messrs. Spiers and Pond, Lond.; *Shrewsbury Chronicle*, Manager of; Staffordshire Education Committee, Stafford, Clerk to the; The Sterling Corporation, Lond., Sec. of; St. Peter's Hospital for Stone, Lond., Sec. of.

T.—Mr. J. T. Thomas, Trowbridge; Tropical Diseases Bureau, Lond.; Capt. N. B. Taylor, C.A.M.C.; Dr. H. H. Thomson, Hertford; Lieut.-Col. C. P. Templeton, R.A.M.C.

U.—University of London.

V.—Col. E. M. B. Vaughan; Vitamogen, Ltd., Lond.

W.—Dr. O. K. Williamson, Lond.; Capt. W. Waddell, R.A.M.C.; West London Hospital Post-Graduate College, Dean of; Dr. J. A. Wilson, Warrington; Mr. W. A. Ward, Richmond; Welsh Hospital, Netley, Commandant of; Whiteley Homes, Lond., Sec. of; Messrs. Willows, Francis, Butler, and Thompson, Lond.; Dr. R. Williams, Lond.; Lieut. F. L. Wood, R.A.M.C.; Wolverhampton and Midland Counties Eye Infirmary, Sec. of; Worcestershire Asylum, Bromsgrove, Medical Supt. of; Mr. C. F. Wakefield, Charlwood.

Letters, each with enclosure, are also acknowledged from—

A.—Aberdeen Royal Infirmary, Clerk to the; A. W. B.; Dr. G. Hely-Hutchinson Almond, Bath; Anglo-French Drug Co., Lond.; Mr. G. H. Adam, West Malling.

B.—Dr. R. W. Beesley, Bolton; Mr. E. Birkenshaw, Newbridge; Mr. W. Bryce, Edinburgh; Capt. H. C. Bazett, R.A.M.C.; Mr. G. P. Butcher, Plymouth; Messrs. Bowes and Bowes, Cambridge.

C.—Dr. T. Carruthers, Kilbarchan; Messrs. E. Cook and Co., Lond.; Messrs. Crossley and Co., Lond.; Capt. E. Cook, R.A.M.C.; Dr. J. R. G. Calverley, D.M., Folkestone; Mr. E. W. Cox, Lond.; Corbett Estate Office, Droitwich; Mr. F. W. Clarke, Chorlton-cum-Hardy.

D.—Prof. K. H. Digby, Hong-Kong; Darlington General Hospital, Sec. of; Dispenser, Cambridge; Mr. G. B. Daunt, Lond.; Messrs. Dowie and Marshall, Lond.

E.—Dr. G. S. Earl, Plymouth; Mr. W. A. Ellis, Middlesbrough; Mrs. Evans, Littlehampton; E. M. W.; E. F. H.; E. M. K.

F.—Mr. F. R. Fisher, Axminster; Messrs. Fannin and Co., Dublin; Mr. J. H. Frazer, Lond.; Dr. M. Fahmy, Edinburgh; Messrs. J. S. Fry and Sons, Bristol.

G.—Dr. J. G. Gordon-Munn, Norwich; Dr. J. Gifford, Mickleover; Dr. A. S. Griffith, Cambridge; Messrs. W. Green and Co., Lond.

H.—Messrs. A. Heywood and Son, Manchester; Holborn Advertising Service, Lond.; Lieut. F. Heatherley, R.A.M.C.; Mr. J. W. Hutchinson, Skelmersdale; Surg. A. M. Horsey, R.N.; H. L. H.

I.—International News Co., Lond.; Icilma Co., Lond.

J.—Jessop Hospital for Women, Sheffield, Sec. of; Messrs. Jacob and Johnson, Winchester.

K.—Messrs. H. S. King and Co., Lond.; Dr. G. Kelman, Peel.

L.—Lieut. G. J. Langley, R.A.M.C.; Messrs. Lee and Nightingale, Liverpool.

M.—Mr. F. R. Mallet, Bolton; Capt. H. B. MacEwen, C.A.M.C.; Manchester Northern Hospital, Sec. of; Nurse Meacock, Lond.; Dr. J. B. MacIlwaine; Messrs. C. Mitchell and Co., Lond.; Messrs. Mertens and Co., Lond.; Major D. F. Mackenzie, R.A.M.C.; Mr. S. Mozumder, Craghead; Dr. J. D. McVean, Oldham; Dr. H. C. Miller, Lond.; Mr. E. Mackay, Stirling; Lieut.-Col. MacLaughlin; Monmouthshire Asylum, Abergavenny, Clerk to the.

N.—Norwood Sanatorium, Beckenham, Sec. of.

O.—Oldham Royal Infirmary, Sec. of.

P.—Dr. H. C. Pattin, Norwich; Portsmouth Lunatic Asylum, Clerk to the; Mr. C. J. Palmer, Mansfield Woodhouse; Messrs. Partridge and Love, Bristol; Mr. E. G. Pullinger, Epsom; Messrs. C. Pool and Co., Lond.; Mrs. Phillips, Lond.; Mr. J. Parrott, Lond.; Portsmouth Guardians, Clerk to the; Dr. I. H. Pearse, Lond.

Q.—Queen's Auxiliary Hospital, Lond., Sec. of.

R.—Mr. W. Ruck, Maidstone; Messrs. Roberts and Co., Lond.; Rhondda Urban District Council, Clerk to the.

S.—Mr. G. H. Shepherd, Exmouth; Saccharin Corporation, Lond.; Smedley's Hydropathic Co., Matlock, Director of; Southampton Corporation, Treas. to the.

T.—Dr. J. N. Todd, Harrogate; Lieut. W. Templeton, R.A.M.C.; Three Counties Asylum, Arlesey, Clerk to the; T. C.; Capt. J. W. Thomson, R.A.M.C.

U.—Capt. H. Upcott, R.A.M.C.

V.—Messrs. J. W. Vickers and Co., Lond.

W.—Dr. A. E. Wilson, Newtonmore; Mr. A. Wilson, Lond.; W. T. S.; Mrs. Webb, Tring; Mr. F. Wells.